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Strategies to Manage Ecotourism Sustainably: Insights from a SWOT-ANP Analysis and IUCN Guidelines

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Abstract: Protected areas are prime areas for ecotourism development, attracting large numbers of visitors to an abundance of ecologically significant and often sensitive flora and fauna. The current study identified adverse impacts of ecotourism in four prominent tourist hotspots in Iran, namely Lar National Park, Jajrud Protected Area with Sustainable Use of Natural Resources, Tangeh Vashi National Natural Monument, and Kavdeh Wildlife Refuge. Impacts were compared against the IUCN guidelines according to the degree of ecological sensitivity and multiple managerial objectives. In addition, an analytic network process (ANP) was applied within a Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis to identify optimal strategies for reducing threats and weaknesses and improving opportunities and strengths for sustainable ecotourism management. We found the greatest negative impacts of ecotourism in a Jajrud that was exposed to rapidly expanding urbanisation and the corresponding development of economic and physical activities. Conversely, the least negative impact occurred in a national park (Lar) that was managed based on conservation approaches, accounting for high ecological sensitivities, and adapting legal prohibitions. The SWOT-ANP analysis demonstrates that certain strategies can minimise impacts and should be adopted as conservation tools by protected area managers and land planners.

Keywords: impact indicators; Iran; tourism infrastructure; tourism management; protected areas; sustainable tourism

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1. Introduction

Sustainable ecotourism serves as a viable alternative to mass tourism, effectively empowering local communities and safeguarding the environment [1]. It is considered a tool to promote sustainability in, for instance, developing countries with rich natural and cultural resources [2]. Ecotourism offers a hybrid of opportunities for environmental protection and income generation for local communities [3], but it also poses a threat with potential long-term negative consequences for ecotourism destinations. The adverse impacts of ecotourists have therefore received increasing attention (e.g., Arsic et al., [4]; Lee and Jan, [5]).

Protected areas (PAs) harbour a great potential for ecotourism development as tourists flock to a diverse system of natural, historical, and cultural attractions. Ecotourism in PA aims to provide job opportunities for local communities and reduce poverty [5]. However, it is crucial to manage sustainable ecotourism effectively, taking into consideration social and environmental sensitivities. This includes ensuring the protection of natural

resources as well as providing opportunities for environmental education and promoting tourism activities that are rooted in nature [6]. Therefore, ecotourism managers face growing pressure to attract a larger number of visitors by offering appropriate amenities and meaningful experiences, all while maintaining environmental conservation and providing visitor education [7]. Unfortunately, over the past decade, many PAs that form a part of the world heritage list have been impacted by unsustainable practises leading to environmental pollution, increased habitat loss, a reduction in biodiversity, and even species extinction [8]. Thus, the expansion of ecotourism activities in PAs poses a significant threat to rare endemic species and ecosystems of high ecological value.

Effective sustainable ecotourism management necessitates strategic planning, which can be accomplished through the identification and analysis of internal factors (IF), such as strengths and weaknesses, as well as external factors (EF), including opportunities and threats [9]. The ultimate goal in sustainable management of these areas is to develop and adopt an appropriate strategy that accounts for both EF and IF [10]. Several studies evidence the importance of this issue for strategic planning and development of sustainable management in PAs using Strengths, Weaknesses, Opportunities, and Threats (SWOT) [11,12], AHP-SWOT [13], and SWOT-ANP [14] methods.

Nevertheless, the management of PAs may encounter significant difficulties when attempting to implement the concept of ecotourism and harness the potential of these areas. Consequently, they must adopt an effective approach to management that encompasses fulfilling societal demands and development objectives. This entails overseeing the PA's boundaries, safeguarding biodiversity [8], and establishing a harmonious relationship between conservation and economic advancement. Consequently, managers of numerous PAs are faced with mounting pressure to draw in a larger number of visitors while catering to their diverse requirements by offering suitable amenities. Furthermore, our motivation to conduct this research stemmed from the lack of well-established strategic plans capable of effectively accomplishing the defined objective of promoting ecotourism development in diverse types of PAs. The present study aims to identify the negative impacts of ecotourism development in PAs, using several sites in Iran as examples, and to investigate the relationship between increasing unsustainability and legal restrictions in various types of PAs. The primary research inquiries addressed in this study are as follows: (1) What are the primary adverse effects of ecotourism that may lead to increasing unsustainability in various types of PAs? (2) What strategies can be used to reduce unsustainable practises? (3) What are the optimal strategies to manage impacts? We first identified the negative impacts of ecotourism, harnessing the knowledge of experts, and then compared these impacts with International Union for Conservation of Nature (IUCN) guidelines, considering existing laws and regulations. Finally, we used a SWOT-ANP model to discuss optimal strategic planning and sustainable ecotourism management in various PAs in Iran. Our study may serve as a blueprint for other PAs to develop strategies to manage impacts using an innovative method that allows for the uncovering of a detailed list of ecotourism impact indicators along with the strengths, weaknesses, opportunities, and threats of PAs.

2. Theoretical Framework

The constructive role of PAs in fostering regional development is readily discernible through a multitude of benchmarking collaborations and partnerships. Resolving the prevailing conflicts among key stakeholders who have an impact on the development and management of PAs poses a significant hurdle to their progress in many countries [15,16]. To enhance collaboration among stakeholders and effectively manage PAs, it is crucial to establish partnerships based on the pursuit of common objectives. Achieving successful partnerships necessitates the active engagement and commitment of all participants, starting with making collective decisions and subsequently implementing planned activities together [17].

Collaborative efforts and proactive engagement between stakeholders in PAs, including local communities, have a beneficial impact on the formulation and implementation of regional development policies, plans, and activities [18,19].

The identification and integration of ecotourism development strategies play a vital role in their successful implementation. Various models are available that can effectively fulfil this objective, with each model offering distinct perspectives and employing different methodologies. Among these models, the SWOT matrix is the most widely used [20]. The SWOT matrix analyses the system by assessing its internal strengths and weaknesses while also considering the external opportunities and threats that it encounters. By deriving a strategy based on these factors, decision-makers can obtain realistic solutions and determine the extent to which the system aligns with the vision of sustainable development. This approach provides guidance for aligning efforts towards the desired and optimal structure. In addition, past studies demonstrate that SWOT analysis is frequently utilised alongside other complementary approaches in many cases, such as Simple Additive Weighting (SAW; [21]), AHP [22], and ANP [23]. This combination allows for the development of scientific plans and the quantification of their significance and prioritisation.

Through an examination of the available scientific literature, it becomes apparent that there is a noticeable absence of a robust connection between theory and practise in the realm of this study. Despite the development of numerous methodological approaches to systemic management in PAs within the field of management science, the actual application of these solutions remains constrained. One of the contributing factors to this resistance is the inadequate integration of theoretical frameworks into existing practises and approaches. As a result, this research proposes a systemic approach to effectively managing various types of PAs.

3. Materials and Methods

3.1. Study Areas

Four PAs were chosen for this study in Tehran province, including Lar National Park (henceforth Lar), Jajrud Protected Area with Sustainable Use of Natural Resources (henceforth Jajrud), Tangeh Vashi National Natural Monument (henceforth Tangeh Vashi), and Kavdeh Wildlife Refuge (henceforth Kavdeh) (Figure 1). These locations were chosen as they represent different types of PAs and because of the presence of abundant natural, historical, and cultural attractions, as well as uncontrolled tourism activities, an excessive number of tourists, and a high level of reported unsustainability in these areas (Table 1).

Table 1. Overview of the four selected study areas.

Name	Size (ha)	Management History	Number of Tourists per Year
Lar	35,800	Since 2001	36,000
Jajrud	74,800	Since 1982	50,000
Tangeh Vashi	3800	Since 2011	300,000
Kavdeh	76,900	Since 2019	40,000

Lar, spanning an area of 35,800 hectares, is situated between Tehran and Mazandaran Provinces. Popular animal species for wildlife viewing include wild sheep (*Ovis orientalis*), wild goats (*Capra aegagrus*), Persian leopards (*Panthera pardus saxicolor*), and grey wolves (*Canis lupus*). *Astragalus* is an important plant genus and an attractive flowering plant. Additionally, this area serves as a habitat for brown trout, which is considered one of the most scarce and precious aquatic species in the Middle East. Jajrud is located in the Tehran metropolis, and the two oldest national parks in Iran are located in Jajrud (Khojir and Sorkheh Hesar). Astragalus is a dominant plant genus here too, and wild sheep and goats are dominant wildlife species. Tangeh Vashi is recognised as a national natural monument and is located in the northeastern part of Tehran province. Wild sheep and goats have been identified as the main wildlife species in this area. Galbanum (*Ferula gumosa*) is the dominant species in terms of plant life. Kavdeh, spanning an area of 76,900 ha, is situated between Tehran and Isfahan Provinces. This region is known for its rich plant and animal diversity. Not only is this area species-rich, but it also provides a significant corridor for wildlife dispersal [24].

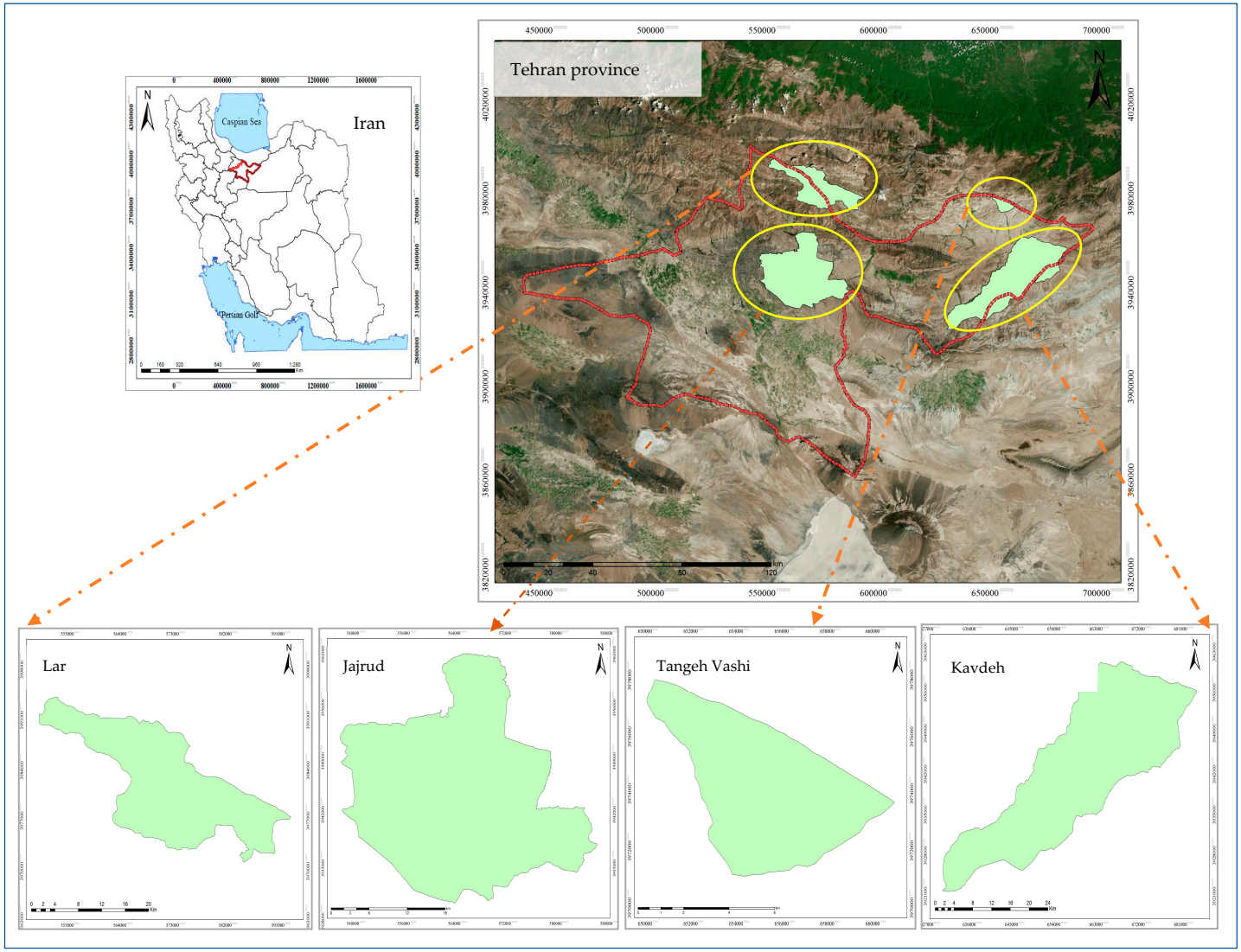

Figure 1. Location of the four diverse types of Protected Areas (PAs) in northern Iran.

3.2. Methodology

3.2.1. Delphi Method

The Delphi method serves as a valuable tool for harnessing group knowledge, enabling planners to attain a theoretical consensus by leveraging expert opinions [25,26]. Moreover, this method can help decision-making based on survey data where individual information is unreliable and expert viewpoints are heterogeneous [27]. Every participant in the study is a specialist in the relevant area and is deliberately kept anonymous to one another [28,29]. Furthermore, all participants unanimously agreed on a specific matter [30]. In the context of Delphi studies, there are varying perspectives on what constitutes the ideal size for the expert panel. The number of expert members can vary greatly, ranging from as few as seven to well over a thousand [31]. Nonetheless, several studies have argued that there is limited empirical evidence supporting a direct correlation between the size of the expert panel and the validity of the consensus procedures [31]. In contrast to statistical studies that rely on representative samples, the Delphi method does not require expert panels to be statistically representative. The validity of the results depends more on the quality and expertise of the panellists than on the sheer number of participants [32]. In the present study, we questioned 40 experts on 66 tourism impact indicators (Tables S1 and S2). Invitations were extended to subject-matter experts in the form of letters, requesting their participation in this study. The experts included academicians, researchers, managers, tour operators, and government and non-government officials (Table S1). To obtain quantitative information and select the most relevant ecotourism impacts, experts were asked to rate the level of impact of the 66 indicators (Table S2) on a 5-point Likert scale. We used the mean to determine ranking, with the lowest mean being number one. Therefore, the indicators of ecotourism impacts were sorted in descending order, starting from high and progressing to low. The Delphi method consisted of a three-round process. During the first round, a questionnaire was created to gather the experiences and viewpoints of the experts. In the second round, the questionnaires were distributed again, with the exception that two respondents chose not to participate. In the final round of the process, the participants were requested to review their initial answers and scores, resulting in one participant choosing not to continue with the process. The objective of the second and third rounds is to reach a consensus or stability among the panel members' answers [28]. To determine the level of agreement among the expert panel members regarding the incorporation of a particular element, the Content Validity Ratio (CVR) [33] was utilised. Altogether, 37 questionnaires were completed and used for analysis.

3.2.2. SWOT-ANP

SWOT analysis is a widely used methodology in natural resource management. The process entails the identification and analysis of the strengths, weaknesses, opportunities, and threats associated with a specific project, initiative, or resource. This approach is employed to facilitate decision-making analysis and enables individuals to identify both internal and external factors within a specific environment. By examining the strengths, weaknesses, opportunities, and threats, stakeholders can gain insights that inform their decision-making processes [34]. The SWOT structural model helps formulate organisational strategy. However, as a qualitative social science tool on its own, it does not provide quantitative matrices that enable direct comparison of all four attributes. To obtain quantitative values for SWOT attributes, the preferred approach is to use the Analytical Network Process (ANP) methodology [35]. The ANP is capable of analysing interdependencies in decision-making problems by utilising an interdependent network structure that allows for connections between elements [35,36]. The ANP method has been widely used to enhance the measurability of SWOT factors and strengthen the quantitative foundation for strategic planning [37–39]. Combining SWOT analysis with an ANP model has proven effective in facilitating decision-making processes [4,37,39,40].

3.2.3. SWOT Analysis

The SWOT model was used to evaluate the IF (i.e., strengths and weaknesses) and the EF (i.e., opportunities and threats) along with their individual, specific sub-factors that can affect sustainable ecotourism development. According to Figure 2, SWOT involves the following steps [41]: (a) Identification of IF and EF; (b) Assessment of IF, EF, and sub-factors; (c) Analysis and formulation of strategies; and (d) Design of the matrix of IF and EF. This process leads to the development of four categories of strategies:

- SO (aggressive strategies): Use strengths and opportunities.
- ST (diverse strategies): Use strengths to avoid threats.
- WO (review strategies): Use opportunities to reduce weaknesses.
- WT (defensive strategies): Reduce weaknesses and avoid threats.

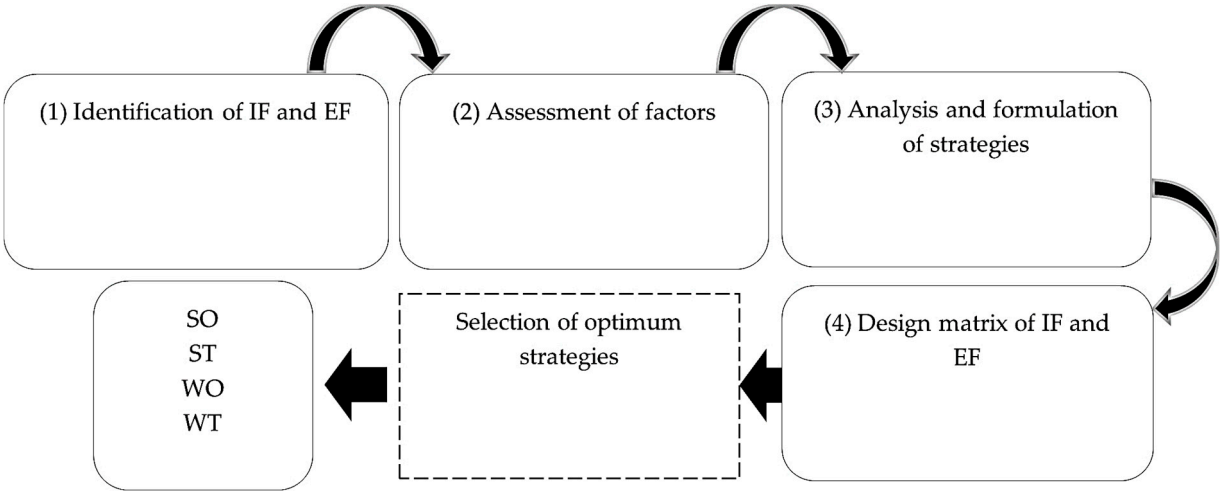

Figure 2. The primary stages involved in the SWOT model.

3.2.4. ANP Model

The ANP model is an integral component of multi-criteria decision-making (MCDM) analysis, providing a means to assess various criteria and their interrelationships. It is essential for solving management problems in PAs because it is possible to develop a list of strategies to improve the situation in these areas [4,42]. Accordingly, the ANP model steps are as follows [43]:

(1) Creating a network structure through modelling and transformation: In this step, the Delphi method is employed to generate a network structure. The issue undergoes a transformation into a network format, with clusters represented as nodes in the network. Elements within each cluster can be connected to other elements within the same cluster or to elements in different clusters.

(2) Generating a matrix of pairwise comparisons and computing priority vectors: During this stage, pairwise comparisons are conducted to evaluate the relative importance of decision elements within each cluster. A matrix is constructed to capture these comparisons, and priority vectors are calculated to determine the influence of each element on the others. The internal significance vector, obtained using Equation (1), represents the relative importance of elements or clusters. Furthermore, the interrelationship between cluster criteria is assessed by referring to Table S3.

$$A = \lambda_{max} \quad (1)$$

where A is the matrix comparison of criteria and λ_{max} is the largest eigenvalue value of the matrix.

(3) Constructing a super-matrix and establishing the limit of a super-matrix: In a system where reciprocal impacts exist, the overall priorities are determined by inserting the internal priority vectors into the corresponding columns of a matrix. This results in a super-matrix that represents the relationships between two clusters within the system. Within this super-matrix, W_{21} represents the vector indicating the target impacts on dimensions, and W_{32} represents the impacts of dimensions on variables. The "I" matrix represents a single matrix. The dimensions mutually influence each other, and this interdependence is captured by incorporating the W_{22} matrix into a W_n super-matrix, as outlined in Equation (2).

$$W_n = \begin{bmatrix} 0 & 0 & 0 \\ 0 & W_{22} & W_{21} \\ W_{33} & W_{32} & 0 \end{bmatrix} \quad (2)$$

This matrix is considered the primary super-matrix. By replacing the vectors of internal priorities of elements and clusters in the primary super-matrix, an unbalanced super-matrix is obtained. In the subsequent step, the values of an unbalanced super-matrix within the cluster matrix are multiplied to compute a harmonic super-matrix. Furthermore, the $\lim(W)^k$ super-matrix is normalised by enabling all elements of the harmonic super-matrix until convergence is reached, meaning that all elements of the super-matrix are aligned in Equation (3).

$$\xrightarrow[k=\infty]{\lim(W)^k} \quad (3)$$

(4) Choosing the optimal alternative: The super-matrix formed in the third stage is analysed to determine the best alternative. The overall priority of each option is calculated based on the options column in the super-matrix. The most optimal solution for the specific subject or problem is identified by choosing the alternative that possesses the highest overall priority among the available options.

3.2.5. Comparing the Negative Impacts of Ecotourism and the Guidelines of the IUCN in PAs

Different types of PAs vary in their biological sensitivity, goals, and management objectives, as well as the physical and economic activities that take place there. IUCN guidelines for management should be adhered to. Accordingly, the current study compared the negative impacts of ecotourism with the management criteria set by the IUCN for PAs [44].

4. Results

4.1. Respondent Demographics

Most respondents (45%) were between 40 and 50 years old (Table S4). Fifty percent of respondents had a Ph.D. degree in tourism disciplines, and 20% of the respondents were employed at a university. Furthermore, 40% of the respondents stated that they had between 10 and 20 years of tourism management experience (Table S4).

4.2. Evaluating the Negative Impacts of Ecotourism on PAs

During the initial round of the Delphi study, a total of 66 impact indicators were derived based on expert opinions and perspectives (Table S5). In the second round, the selection process resulted in the identification of 65 indicators, as indicated in Table S6. In the third round, 63 indicators were selected based on the responses (Table 2). Moreover, the findings from the study reveal that Jajrud demonstrates the highest average negative impacts of ecotourism, scoring 3.14, whereas Lar exhibits the lowest average impacts with a score of 2.78 (Table 2).

Table 2. Mean levels for ecotourism impact indicators based on 5-point Likert scale ratings by tourism management experts (n = 37) for four different Protected Areas (third round of the Delphi method). Grey highlights indicate the highest mean values, meaning the greatest impacts.

Dimension	Variables	Indicators	Lar		Jajrud		Tangeh Vashi		Kavdeh	
			Mean Dimensions	Mean	Mean Dimensions	Mean	Mean Dimensions	Mean	Mean Dimensions	Mean
Physical-environmental	Environmental pollution	(1) Increase of environmental pollution (water, soil, air, visual, and noise)	2.80	3.38	3.20	4.27	3.16	4.36	2.88	3.58
	Ecosystem	(2) Increase in destruction of natural ecosystems (mountains, forests, deserts, and wetlands)		2.18		4.15		4.28		3.64
		(3) Increased change in ecosystem structure and function		3.75		4.45		4.20		3.46
		(4) Decrease in ecosystem services		2.27		3.70		4.02		3.34
		(5) Increased habitat fragmentation		2.06		4.50		4.00		3.85
		(6) Increased land use/land cover (LULC) changes		1.95		4.65		3.68		3.2
	Wildlife habitat	(7) Increase in wildlife hunting (poaching)		3.63		3.46		3.20		4.52
		(8) Increase in species extinction		3.50		3.60		3.26		4.35
		(9) Increased wildlife migration		3.82		3.56		2.43		4.46
		(10) Increased change in wildlife behaviour (feeding, migration, reproduction)		3.48		3.50		3.00		4.22
	Vegetation	(11) Decrease in the quality of vegetation		4.20		3.36		2.11		3.18
		(12) Increase in cut-down trees and shrubs		4.11		3.24		3.33		3.05
		(13) Decrease of high-density pasture		4.38		3.42		3.63		2.94
		(14) Increase of fires in forests and pastures		3.17		3.86		1.42		2.84
	Biodiversity	(15) Decrease in biodiversity		3.32		3.18		3.82		4.08
		(16) Decrease in rare or dominant species		3.24		3.10		3.40		3.15
	Resources consumption	(17) Decrease in renewable resources (water, soil, and air)		2.36		2.74		3.36		2.72
		(18) Increase in water resource consumption		1.76		2.82		3.30		2.65
		(19) Increase in energy consumption and types of fuels		3.25		2.71		2.16		2.47
	Waste and sewage	(20) Increase in waste generated by ecotourism		3.08		2.66		3.76		2.33
		(21) Increase of sewage generated by ecotourism		1.62		2.57		3.63		2.26
	Safety	(22) Increase in accident rates		2.64		1.30		3.52		1.87
		(23) Increase of road traffic		2.80		1.42		2.20		1.60
		(24) Decrease in access to emergency services		1.54		1.58		2.28		1.34
	Environment/ protection	(25) Increase in destruction of natural, cultural, historical, and man-made attractions		2.75		2.38		3.45		2.11
		(26) Increase in visiting time and presence of tourists in PAs		2.43		2.32		3.40		2.20
		(27) Increased threat to strict natural zones and sensitive habitats		3.11		2.47		3.16		3.77
		(28) Increased numbers of tourists in PAs		2.46		2.33		3.68		1.67
	Access	(29) Decrease in access to facilities and tourism infrastructure		1.32		3.15		1.45		1.43
		(30) Increase in road infrastructure and transportation networks		2.20		4.42		2.36		1.66
		(31) Increase in construction and tourist accommodation		1.28		4.56		2.35		1.52
Socio-cultural	Security	(1) Decrease in social security	2.76	3.45	3.07	4.11	2.90	3.50	2.78	3.88
		(2) Decrease of educational programmes for tourists		3.38		1.54		2.25		2.11
	Culture	(3) A decline in the acceptance and integration of new cultural and moral values among local residents		3.33		3.22		3.65		2.35
		(4) A decline in the adherence to local values and traditions		3.20		3.30		3.60		2.55
		(5) Increased change in the culture of local communities from the current situation		3.18		3.43		4.00		2.72
	Satisfaction	(6) Increase in change in the quality of life standards		3.00		3.65		3.46		1.86
		(7) Decrease in satisfaction among local communities		2.92		3.50		3.33		3.64
	Participation	(8) Decrease in participation in nature protection and development of sustainable ecotourism		3.60		3.82		3.25		3.76
	Justice	(9) Decreased access to facilities and local infrastructure		1.52		2.77		3.11		3.54
		(10) Decreased access to facilities and educational services		1.68		2.36		2.73		3.32
		(11) Increased job opportunities for local communities		2.85		3.02		2.51		3.20
		(12) Decrease in local household income		2.32		3.11		2.26		2.85
		(13) Increase in cost for local households		2.45		3.35		1.74		3.15
	Population	(14) Increased migration of local residents		2.68		2.57		1.37		1.46
		(15) Increase in density of local residents		1.85		2.36		2.8		1.35
Economic-institutional	Employment and income	(1) Increase in change in various employments	2.78	2.11	3.15	2.84	3.10	2.45	2.83	1.88
		(2) Increased economic pressure among households		1.82		2.70		2.64		2.11
		(3) Increase in the change in income of local communities		2.20		2.55		2.85		2.23
	Cooperation	(4) Increase of conflicts between governmental and non-governmental organisations		2.42		4.15		3.00		2.38
		(5) Decrease in cooperation between governmental and non-governmental organisations in planning and decision making		2.63		4.02		3.12		2.46
	Monitoring and control	(6) Decrease in protection monitoring		3.70		3.88		3.70		2.96
		(7) Decrease in monitoring of ecotourism activities		3.32		3.64		4.12		2.58
	Rules and regulations	(8) Decreased attention to protective rules and regulations		3.63		3.75		3.92		3.7
		(9) Decrease in implementation of strict legal guidelines		3.52		3.58		3.78		3.88
		(10) A reduction in the accessibility of local laws and regulations		3.44		3.23		3.66		3.46
		(11) Decrease in compliance with laws and regulations		3.36		3.45		3.50		3.58
	Institutional element	(12) Decline in the performance quality of both governmental and non-governmental institutions (by increasing the number of tourists)		3.28		3.30		3.42		3.35
		(13) Deterioration in the performance of managers regarding training and information (by increasing the number of tourists)		3.15		3.18		3.33		3.24
		(14) Decrease in the quality of environmental guardians' performance in the protection of an area (by increasing the number of tourists)		2.90		3.00		3.24		3.12
	Local prices	(15) Increase in prices, including commodities, accommodations, and property		2.78		2.35		2.32		2.85
	Economic activity	(16) Increase in change in economic activities and income		1.63		2.20		2.07		2.70
	Ethical principle	(17) Decrease of beliefs and notice of ethical principles		1.47		1.84		1.75		1.72
Total mean			2.78	-	3.14	-	3.05	-	2.83	-

4.3. Comparing the Negative Impacts of Ecotourism and the Guidelines of the IUCN in PAs

As demonstrated in Table 3, each of the studied areas has specific managerial objectives and prohibitions for the development of human activities that must be considered in the use of these areas. However, the results also indicate that visible conflicts arise from human activities (Table 3). In Lar National Park, the major conflicts directly and indirectly relating to tourism include the presence of tourists in sensitive areas, overgrazing livestock, injury to brown trout (*Salmo trutta fario*), destruction of vegetation, an increase in environmental pollution, and land use/land cover (LULC) changes. At the same time, consumptive or physical uses are prohibited (Table 3). In addition, Lar has the highest degree of ecological sensitivities and legal prohibitions, whose purpose is to minimise the negative impacts of ecotourism (Table 3). Since Jajrud is located in the metropolis of Tehran, it is affected by a variety of physical and economic activities. On the other hand, according to the guidelines of the IUCN, the management of Jajrud is based on the principles of sustainability and adaptation to nature. Likewise, in Tangeh Vashi National Natural Monument, the development of tourism activities causes an increase in conflicts because of soil erosion, dispersal of waste and sewage production, environmental pollution, livestock overgrazing, poaching in the area, and LULC changes (Table 3). However, according to the guidelines of the IUCN, Tangeh Vashi is characterised by the highest protection priority and degree of biological sensitivity after national parks, and its management goal is to preserve the natural conditions of national natural monuments. Finally, in Kavdeh Wildlife Refuge, major conflicts observed include the threat to habitats due to the presence of tourists and ranchers in sensitive regions, livestock overgrazing, poaching in the area, LULC changes, the development of unplanned tourism activities, and the development of agricultural activities (Table 3). Despite that, the management objective in Kavdeh is based on measures to improve habitat conditions and species conservation. Accordingly, in all studied areas, results indicate that extensive development of human activities and a lack of attention to protection and legal standards contribute to unsustainability (Table 3).

Table 3. Comparison of ecotourism's negative impacts following IUCN guidelines (IUCN/WCMC, 1994) for four protected areas in Iran.

PAs	Characteristics	Objectives	Management Type	Use Type	Types of Conflicts/Issues in Studied Areas (Directly and Indirectly Relating to Tourism)
Lar	- Samples of excellent ecosystems and landscapes of national importance - Unique samples of ecological forms - Outstanding samples of geographical or geological units	Deliver continuous maintenance of systems in natural conditions for non-consumptive or non-physical uses	- Preservation of natural values and integrity - Prevent any use inside or around the border - Control of destructive factors in the park - Use management plans to control the negative impacts of ecotourism	- Consumption and physical development are prohibited in national parks - Recreational uses in these areas are allowed at the level of 5% - The use of national parks in the country is based on their capacity, zoning plan, and appropriate recreational equipment. - Educational and research uses according to the management plan and zoning	- Access and presence of tourists in sensitive areas (safe and protected zones) - Destruction of the environment due to tourism activities - Injury to aquatic stocks (*Salmo trutta fario*) due to illegal fishing - Destruction of vegetation due to cutdown trees and shrubs by tourists - Increase in environmental pollution due to waste and sewage produced by tourism activities - Overgrazing livestock and the presence of nomads in the safe and protected zone - Development of construction and LULC changes

Table 3. *Cont.*

PAs	Characteristics	Objectives	Management Type	Use Type	Types of Conflicts/Issues in Studied Areas (Directly and Indirectly Relating to Tourism)
Jajrud	These areas hold significant ecosystem diversity that is managed to conserve plant and animal diversity	Provide conditions for restoration and reconstruction of ecosystems, plant and animal species, and improve habitat conditions	- Development of human activities based on zoning - Preservation of human activities in security areas and protection zones (1/5 of the area level is selected as a safe area)	- Different natural capabilities, according to the zoning plans and estimate of carrying capacity, include consumptive and non-consumptive uses - The management is based on the principles of sustainability and adaptation to nature - Use types include pasture exploitation, livestock breeding, recreational, educational, and research uses	- Construction of dams (Mamlu and Latian dams) - Development of roads and construction of highways - Development of industries and mining activities - Development of tourism infrastructure and activities - Development of military activities and barracks - Assignment of the area to different organisations - Types of environmental pollution (such as water, soil, noise, and visual) due to tourism activities - Dispersal of waste and sewage produced by tourism activities - Soil erosion and vegetation degradation
Tangeh Vashi	- Natural phenomena and valuable heritage in the country - Rare phenomena of plant or animal species - Physical phenomena with outstanding features - Examples of scientific value, aesthetics, geology, and natural history	Preservation of scientific values and their special features in natural conditions for non-consumptive uses such as education, limited visits, and interpretation	- These areas are the most sensitive PAs in the country after national parks, so the development of uncontrolled human activities is prohibited - Preservation of the natural conditions of national natural monuments against human activities - Prevention of physical activity without planning and studying	In these areas, educational, research, and interpretive uses are allowed for visitors	- High density of tourists - Increased destruction in the area due to a lack of tourism facilities - Soil erosion due to the high density of livestock - Types of environmental pollution (such as water, soil, noise, and visual) due to tourism activities - Livestock overgrazing - Poaching - LULC changes - Dispersal of waste and sewage produced by tourism activities
Kavdeh	These areas are home to prominent natural habitats and special climatic conditions for wildlife, which have been protected to preserve or rehabilitate habitats	Maintaining and improving the quantity and quality of habitat for authorised exploitation and following management principles	- Management is based on measures to improve habitat conditions and species conservation - Increasing the quality of habitat and animal species - The management goals do not conflict with natural features	- The consumptive use of animal species is possible through the issuance of hunting licences (for species with sufficient population numbers) - Recreational and research uses according to management and zoning plans	- The presence of tourists and ranchers in safe and sensitive habitats - Livestock overgrazing - Poaching - LULC changes - Development of unplanned tourism activities - Excessive productivity of villagers on the land to develop agricultural activities

4.4. Assessment of Factors (IF and EF)

The findings indicate that in Lar, Tangeh Vashi, and Kavdeh, the strengths category received the highest score, while the threats category obtained the lowest score (Tables 4–7). Accordingly, the strengths and opportunities identified for these areas were more important than the identified weaknesses and threats. Likewise, in Jajrud, we demonstrate that the threats category received the highest score, while the lowest is related to opportunities (Tables 4–7).

Table 4. Weighting of SWOT factors and sub-factor matrix in the Lar.

Internal Factors	Factor Weight	SWOT Sub-Factors	Sub-Factor Weight	Final Weight
Strengths (S)	0.455	S_1: Pristine habitat and natural conditions	0.187	0.085
		S_2: High richness of vegetation and wildlife species	0.176	0.080
		S_3: Existence of valuable aquatic resources, especially *S. trutta fario*	0.146	0.066
		S_4: Existence of great natural attractions (such as the landscape of Damavand Peak and the existence of Lar lake)	0.122	0.05
		S_5: Mountainous conditions	0.098	0.044
		S_6: Existence of abundant water resources, including springs, rivers, and Lar Lake	0.082	0.037
Weaknesses (W)	0.132	W_1: Lack of monitoring the number of livestock and grazing outside of the season	0.168	0.022
		W_2: Insufficiency of guard stations and environmental guardians for tourist monitoring	0.142	0.018
		W_3: High tourism restrictions resulting from an abundance of pristine areas	0.128	0.016
		W_4: Inadequate infrastructure and tourism services	0.088	0.011
		W_5: Short period of ecotourism activities and visits (June to September)	0.068	0.008
External factors	**Factor Weight**	**SWOT Sub-Factors**	**Sub-Factor Weight**	**Final Weight**
Opportunities (O)	0.321	O_1: Possibility of developing educational and research activities due to pristine conditions and the existence of valuable aquatic resources	0.172	0.055
		O_2: Possibility of developing sport-fishing in rivers (such as the Haraz river on Pleur road)	0.146	0.046
		O_3: Possibility of developing ecotourism activities in the extensive recreation area due to its high potential and many tourist attractions	0.121	0.038
		O_4: Possibility of converting the area into a mountaineering and rock-climbing hotspot	0.108	0.034
		O_5: Possibility of developing and exploiting medicinal plants due to the diversity of plant species	0.092	0.029
Threats (T)	0.117	T_1: Issuance of livestock grazing licences exceeding grazing capacity	0.162	0.018
		T_2: Destruction of pastures and loss of vegetation due to overgrazing	0.156	0.018
		T_3: Threats to habitat security due to the entry of tourists and access	0.124	0.014
		T_4: Change in behaviour patterns and wildlife migration due to the presence of tourists and nomads	0.115	0.013
		T_5: Gradual decrease of tourists due to legal restrictions	0.074	0.008
		T_6: Destruction of ecosystems and natural resources with the development of road infrastructure	0.063	0.007

Table 5. Weighting of SWOT factors and sub-factor matrix in the Jajrud.

Internal Factors	Factor Weight	SWOT Sub-Factors	Sub-Factor Weight	Final Weight
Strengths (S)	0.334	S_1: The area holds the distinction of being one of the world's oldest PAs	0.174	0.058
		S_2: Presence of two unique and old national parks (Khojir and Sorkheh Hesar) characterised by high levels of plant and animal species richness	0.162	0.054
		S_3: Great biodiversity and valuable genetic resources	0.139	0.046
		S_4: Located in the interior of Tehran city, with the possibility of daily visits and high access to ecotourism	0.125	0.041
		S_5: Existence of many tourism attractions	0.104	0.034
		S_6: Existence of many summer villages	0.093	0.031
		S_7: The importance of Mamlu dam in supplying drinking water to the area	0.087	0.029
Weaknesses (W)	0.228	W_1: Insufficient monitoring of the development of construction, industrial, and mining activities	0.158	0.036
		W_2: Habitat fragmentation due to the development of road infrastructure and highways within the area	0.146	0.033
		W_3: Existence of various organisations for physical and economic exploitation	0.127	0.028
		W_4: Existence of military industries and barracks and their negative impacts on the development of ecotourism	0.116	0.026
		W_5: Devolution of a large part of the area to the Municipal organisation for the construction of parks and green spaces	0.108	0.024

Table 5. *Cont.*

External Factors	Factor Weight	SWOT Sub-Factors	Sub-Factor Weight	Final Weight
Opportunities (O)	0.137	O_1: Possibility of developing ecotourism activities due to the high potential of tourism and many attractions	0.142	0.019
		O_2: Possibility of developing monitoring mechanisms to prevent the destruction of the area due to the existence of Khojir and Sorkheh Hesar national parks within the area	0.124	0.016
		O_3: Possibility of visiting and offering ecotourism experiences in all seasons due to suitable climatic diversity	0.094	0.012
		O_4: Possibility of converting areas into an urban green habitat for air purification, leisure, and creating a pristine and calm environment	0.085	0.011
		O_5: Possibility of using ecotourism development experiences in this area compared to other areas due to its long history	0.073	0.010
Threats (T)	0.368	T_1: Possibility of the destruction of natural resources and ecosystems due to the development of construction, industrial, and mining activities	0.198	0.072
		T_2: Increased stress levels of animal species due to high noise pollution from vehicles and the possibility of their migration from this area	0.186	0.068
		T_3: Existence of an intervention organisation for development and planning processes	0.138	0.050
		T_4: Possibility of a gradual decrease in tourists due to the existence of multiple military and security areas	0.121	0.044

Table 6. Weighting of SWOT factors and sub-factor matrix in the Tangeh Vashi.

Internal Factors	Factor Weight	SWOT Sub-Factors	Sub-Factor Weight	Final Weight
Strengths (S)	0.342	S_1: Unique attractiveness due to movement in the river and the existence of a long tourist route between two straits	0.184	0.062
		S_2: Existence of historical painted inscriptions of past kings and their impacts on attracting tourists	0.175	0.059
		S_3: Suitable climate due to its location in the Alborz highlands	0.118	0.040
		S_4: Pristine and natural area and lack of physical construction	0.104	0.035
Weaknesses (W)	0.175	W_1: Growth of various environmental pollutants due to the uncontrolled activities of tourists	0.146	0.025
		W_2: Insufficient staffing to guide and monitor tourist activities	0.131	0.022
		W_3: Lack of proper welfare centres and accommodation for tourists	0.115	0.020
		W_4: Dissatisfaction of local communities due to high density of tourists, road traffic, and increased noise pollution	0.087	0.015
External Factors	**Factors Weight**	**SWOT Sub-Factors**	**Sub-Factor Weight**	**Final Weight**
Opportunities (O)	0.286	O_1: Possibility of developing tourism activities due to favourable weather conditions and the high potential of the area (mountaineering, water sports, etc.)	0.166	0.047
		O_2: Possibility of expanding ecotourism in the area due to its pristine and natural environment	0.153	0.043
		O_3: Possibility of increasing job opportunities related to ecotourism for local communities	0.125	0.035
		O_4: Possibility of developing small-scale tourism and residential services in the area to attract more tourists	0.098	0.028
Threats (T)	0.123	T_1: Possibility of ecosystem degradation and pollution due to tourist overcrowding on the weekends and during holidays	0.136	0.016
		T_2: Destruction of vegetation in the area due to livestock overgrazing and uncontrolled activities of tourists	0.124	0.015
		T_3: Decrease of a sense of safety for tourists due to low access to rescue bases, fire services, and security forces	0.094	0.011
		T_4: Possibility of growing scattered and unbalanced constructions due to lack of necessary manpower and insufficient monitoring	0.083	0.010
		T_5: Possibility of environmental hazards such as floods due to the environmental conditions near the Tangeh Vashi river	0.068	0.008

Table 7. Weighting of SWOT factors and sub-factor matrixes in the Kavdeh.

Internal Factors	Factor Weight	SWOT Sub-Factors	Sub-Factor Weight	Final Weight
Strengths (S)	0.326	S_1: Existence of the best habitats for wildlife protection	0.184	0.060
		S_2: High richness of animal species	0.178	0.058
		S_3: Existence of natural attractions, including Ahanac lake, Bornic cave, and Khomdeh spring	0.163	0.053
		S_4: Favourable climatic conditions	0.112	0.036
		S_5: Existence of abundant rivers (Gorsefid, Namrud, and Hablehrud Rivers)	0.108	0.035
Weaknesses (W)	0.162	W_1: Inadequate infrastructure and limited availability of tourism services	0.144	0.023
		W_2: Absence of comprehensive management plans and zoning measures	0.136	0.022
		W_3: Limited availability of guard stations and environmental custodians, resulting in inadequate monitoring capabilities	0.072	0.011
		W_4: Excessive numbers of livestock	0.064	0.010
External Factors	**Factors Weight**	**SWOT Sub-Factors**	**Sub-Factor Weight**	**Final Weight**
Opportunities (O)	0.286	O_1: Possibility of developing sustainable ecotourism due to high tourism potential	0.175	0.050
		O_2: Possibility of resuscitating habitats and increasing wildlife species	0.156	0.044
		O_3: Possibility of developing and exploiting medicinal plants	0.122	0.034
Threats (T)	0.124	T_1: Damage to trees and shrubs by tourists and overgrazing	0.103	0.012
		T_2: Occupancy and increase of LULC changes	0.096	0.011
		T_3: Conflicts between local communities and wildlife	0.085	0.010
		T_4: Wildlife hunting	0.044	0.005

4.5. Determination and Selection of the Best Strategy

According to expert opinion, the "SO" strategy emphasises the development of public education to inform on less impactful behaviour (Tables 8–11). In addition, it provides opportunities for tourists to have meaningful experiences in nature. The second strategy is "ST", which combines strengths and threats. This necessitates controlling factors such as habitat degradation and pollution, conserving tourism attractions, expanding tourism activities, and LULC changes (Tables 8–11). Another strategy is the "WO" strategy, which emphasises developing and improving ecotourism infrastructure and facilities, increasing protective equipment and infrastructure, developing partnerships between tourism stakeholders and relevant organisations, and revising rules and regulations to enhance institutional cooperation in managing and safeguarding study sites. In addition, the "WO" strategy is focused on investing in the private sector in these areas and increasing their partnership with government agencies to protect ecosystems and biodiversity and to responsibly develop ecotourism infrastructure (Tables 8–11). Finally, the "WT" strategy, a defensive strategy, was created by combining weaknesses and threats. This approach seeks to promote and cultivate institutional cooperation to protect ecosystems and biodiversity and to control human economic and physical activities (Tables 8–11).

In Lar, "SO" strategies were selected for strategic planning and management of sustainable ecotourism ventures (Table 12 and Figure 3). In Jajrud, "WT" strategies were thought to be most effective (Table 13 and Figure 3). In Tangeh Vashi, "ST" strategies were selected as the best choice for strategic planning and development of sustainable ecotourism ventures (Table 14 and Figure 3). Finally, in the Kavdeh Wildlife Refuge, "ST" strategies were also deemed most effective (Table 15 and Figure 3).

Table 8. Matrix of strategies in the Lar.

SWOT Matrix	Strengths (S)	Weaknesses (W)
Opportunities (O)	Aggressive strategies (SO) - Development of educational and research activities due to its pristine habitat and abundant population of *S. trutta fario* - Development of fishing sport in rivers because of the presence of valuable aquatic resources (e.g., *S. trutta fario*) - Converting the area into a mountaineering and rock-climbing hotspot around Damavand Peak	Review strategies (WO) - Development of ecotourism activities in the extensive recreation area due to the high percentage of pristine areas - Augmenting the quantity of guard stations and environmental guardians to enhance the monitoring of tourism activities - Developing and exploiting medicinal plants because of the diversity of species as a means to develop ecotourism experiences
Threats (T)	Diverse strategies (ST) - Controlling the development of road infrastructure to protect the pristine habitat - Monitoring of livestock grazing licences to remain within grazing capacity - Preventing ecosystem destruction to protect the great plant and animal species richness	Defensive strategies (WT) - Monitoring of ecotourism activities due to changes in behaviour patterns and wildlife migration - Increasing ecotourism restrictions within pristine and sensitive zones - Preventing the destruction of pastures and loss of vegetation by controlling the number of livestock and grazing time

Table 9. Matrix of strategies in the Jajrud.

SWOT Matrix	Strengths (S)	Weaknesses (W)
Opportunities (O)	Aggressive strategies (SO) - Converting the area into an urban green habitat for air purification, leisure, and creating a pristine and calm environment - Development of ecotourism activities in the area due to the high potential of ecotourism and the existence of many attractions - Development of monitoring mechanisms to prevent the destruction of natural resources, especially because of the existence of national parks in this area (great richness of plant and animal species)	Review strategies (WO) - Increase of monitoring mechanisms for the development of construction, industrial, and mining activities - Use of ecotourism development experiences in the area to control negative impacts from military-related industries and barracks on ecotourism development - Control of habitat fragmentation in the area due to high tourist congestion in all seasons
Threats (T)	Diverse strategies (ST) - Decrease the threat to wildlife habitats to protect existing biodiversity and valuable genetic resources - Increase the level of monitoring of access and visiting times for tourists to prevent the destruction of ecosystems and natural resources	Defensive strategies (WT) - Control and prevention of physical and economic exploitation by intervening organisations - Transmission of military industries and noisy vehicles from this area to reduce the stress level of animal species and prevent their migration - Enhance the area's attractiveness for tourists by eliminating security audits through barracks and military industries in the area

Table 10. Matrix of strategies in the Tangeh Vashi.

SWOT Matrix	Strengths (S)	Weaknesses (W)
Opportunities (O)	Aggressive strategies (SO) - Development of ecotourism activities due to the existence of unique attractions (located between two straits) - Increasing job opportunities related to ecotourism activities for local communities due to favourable climatic conditions that provide a steady source of income	Review strategies (WO) - Development of small-scale tourism and residential services to accommodate tourists and meet their needs - Development of nature-based tourism to prevent LULC changes in the area and reduce levels of environmental pollution
Threats (T)	Diverse strategies (ST) - Controlling the growth of scattered constructions to protect historical inscriptions - Increasing a perceived sense of safety in tourists by increasing access to critical infrastructure (rescue bases, fire brigades, etc.)	Defensive strategies (WT) - Increasing the number of people to monitor and prevent the destruction of ecosystems - Decrease levels of dissatisfaction in local communities by increasing the monitoring of the overcrowding of tourists on weekends and holidays

Table 11. Matrix of strategies in the Kavdeh.

SWOT Matrix	Strengths (S)	Weaknesses (W)
Opportunities (O)	Aggressive strategies (SO) - Development of sustainable ecotourism activities capitalising on the great potential of the many natural attractions on site - Developing and exploiting medicinal plants because of the favourable climatic conditions relating to the Alborz Mountain climate	Review strategies (WO) - Development of infrastructure and ecotourism services outside the area to rehabilitate natural habitats and increase wildlife populations - Implementation of a comprehensive management plan to improve the area as conservation support for valuable animal species
Threats (T)	Diverse strategies (ST) - Decreasing conflicts between local communities and wildlife to preserve the best habitats and wildlife refuges - Preventing occupations and LULC changes to protect rich and diverse vegetation	Defensive strategies (WT) - Monitoring of the cutting of trees and shrubs by tourists and overgrazing by livestock - Increasing the number of equipment and protection facilities to control wildlife hunting

Table 12. Matrix of weighted strategies for the Lar using the ANP method.

Internal Factors	Factor Weight	SWOT Sub-Factors	Sub-Factor Weight	Strategies			
				SO	ST	WO	WT
Strengths (S)	0.455	S_1	0.287	0.125	0.131	0.147	0.125
		S_2	0.268	0.137	0.147	0.127	0.133
		S_3	0.247	0.114	0.124	0.114	0.154
		S_4	0.198	0.138	0.172	0.138	0.178
		S_5	0.311	0.118	0.141	0.122	0.211
		S_6	0.147	0.224	0.126	0.176	0.341
Weaknesses (W)	0.132	W_1	0.275	0.184	0.145	0.184	0.114
		W_2	0.268	0.165	0.132	0.162	0.141
		W_3	0.257	0.142	0.149	0.147	0.126
		W_4	0.198	0.124	0.154	0.184	0.139
		W_5	0.326	0.154	0.108	0.224	0.168
External Factors	**Factor Weight**	**SWOT Sub-Factors**	**Sub-Factor Weight**	**Strategies**			
				SO	**ST**	**WO**	**WT**
Opportunities (O)	0.321	O_1	0.298	0.114	0.123	0.127	0.145
		O_2	0.286	0.138	0.145	0.135	0.138
		O_3	0.238	0.184	0.174	0.141	0.178
		O_4	0.187	0.165	0.126	0.169	0.115
		O_5	0.147	0.236	0.112	0.187	0.132
Threats (T)	0.117	T_1	0.238	0.124	0.136	0.174	0.126
		T_2	0.208	0.138	0.152	0.163	0.136
		T_3	0.198	0.115	0.127	0.187	0.162
		T_4	0.185	0.132	0.116	0.119	0.147
		T_5	0.172	0.187	0.171	0.126	0.131
		T_6	0.154	0.135	0.166	0.187	0.144
Strategies final weight		-	-	0.368	0.248	0.321	0.193

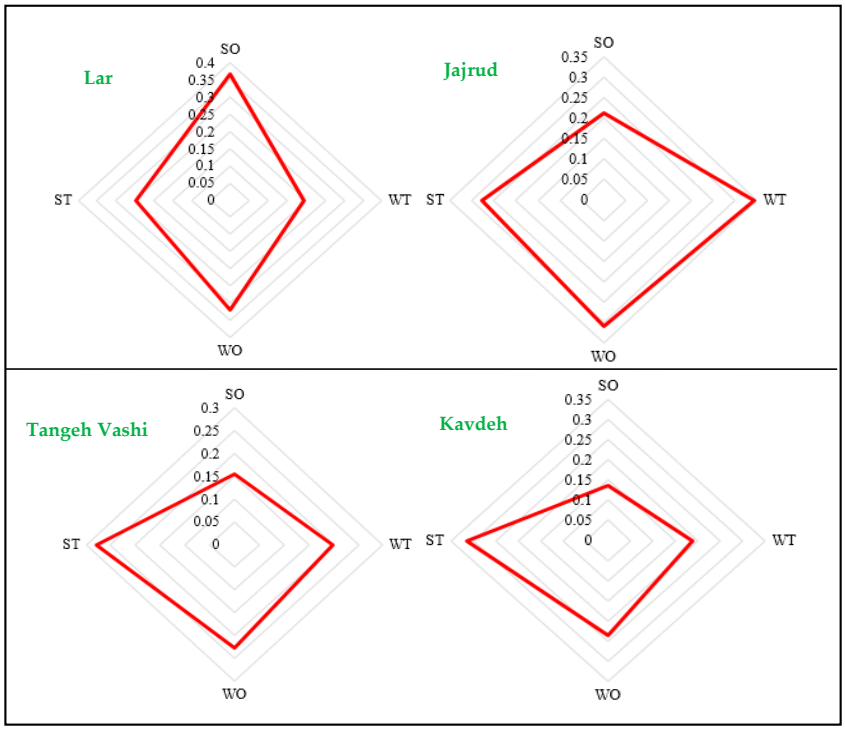

Figure 3. The quadrilateral of the SWOT-ANP strategies in the studied areas.

Table 13. Matrix of weighted strategies for the Jajrud using the ANP method.

Internal Factors	Factor Weight	SWOT Sub-Factors	Sub-Factor Weight	Strategies			
				SO	ST	WO	WT
Strengths (S)	0.334	S_1	0.145	0.151	0.226	0.275	0.168
		S_2	0.126	0.185	0.232	0.184	0.135
		S_3	0.163	0.238	0.345	0.161	0.121
		S_4	0.124	0.343	0.227	0.157	0.138
		S_5	0.128	0.242	0.148	0.287	0.215
		S_6	0.287	0.315	0.168	0.336	0.154
		S_7	0.187	0.354	0.245	0.126	0.167
Weaknesses (W)	0.228	W_1	0.134	0.228	0.314	0.152	0.229
		W_2	0.164	0.273	0.117	0.308	0.178
		W_3	0.158	0.234	0.118	0.342	0.287
		W_4	0.161	0.254	0.157	0.221	0.188
		W_5	0.154	0.360	0.174	0.336	0.146
External Factors	**Factor Weight**	**SWOT Sub-Factors**	**Sub-Factor Weight**	**Strategies**			
				SO	**ST**	**WO**	**WT**
Opportunities (O)	0.137	O_1	0.126	0.232	0.171	0.246	0.189
		O_2	0.163	0.318	0.187	0.154	0.245
		O_3	0.175	0.268	0.345	0.151	0.278
		O_4	0.158	0.324	0.215	0.181	0.174
		O_5	0.227	0.144	0.239	0.148	0.346
Threats (T)	0.368	T_1	0.316	0.148	0.247	0.185	0.172
		T_2	0.117	0.187	0.154	0.347	0.256
		T_3	0.126	0.315	0.263	0.184	0.141
		T_4	0.158	0.354	0.242	0.111	0.147
Strategies final weight		-	-	0.211	0.278	0.308	0.344

Table 14. Matrix of weighted strategies for the Tangeh Vashi using the ANP method.

Internal Factors	Factor Weight	SWOT Sub-Factors	Sub-Factor Weight	Strategies			
				SO	ST	WO	WT
Strengths (S)	0.342	S_1	0.224	0.363	0.168	0.152	0.111
		S_2	0.143	0.137	0.236	0.182	0.378
		S_3	0.126	0.311	0.224	0.173	0.146
		S_4	0.274	0.314	0.278	0.166	0.241
Weaknesses (W)	0.175	W_1	0.176	0.265	0.163	0.214	0.127
		W_2	0.144	0.187	0.218	0.324	0.133
		W_3	0.168	0.326	0.145	0.278	0.344
		W_4	0.115	0.246	0.137	0.215	0.149
External Factors	**Factor Weight**	**SWOT Sub-Factors**	**Sub-Factor Weight**	**Strategies**			
				SO	**ST**	**WO**	**WT**
Opportunities (O)	0.286	O_1	0.175	0.211	0.356	0.148	0.153
		O_2	0.147	0.238	0.341	0.122	0.265
		O_3	0.156	0.213	0.145	0.387	0.173
		O_4	0.133	0.151	0.238	0.347	0.144
Threats (T)	0.123	T_1	0.328	0.266	0.145	0.368	0.157
		T_2	0.153	0.274	0.344	0.235	0.128
		T_3	0.171	0.364	0.278	0.155	0.315
		T_4	0.363	0.278	0.174	0.387	0.108
		T_5	0.165	0.263	0.375	0.123	0.144
Strategies final weight		-	-	0.154	0.278	0.227	0.198

Table 15. Matrix of weighted strategies for the Kavdeh using the ANP method.

Internal Factors	Factor Weight	SWOT Sub-Factors	Sub-Factor Weight	Strategies			
				SO	ST	WO	WT
Strengths (S)	0.326	S_1	0.145	0.154	0.165	0.142	0.171
		S_2	0.213	0.211	0.187	0.158	0.225
		S_3	0.156	0.156	0.176	0.107	0.314
		S_4	0.107	0.165	0.321	0.234	0.144
		S_5	0.147	0.147	0.156	0.267	0.165
Weaknesses (W)	0.162	W_1	0.326	0.166	0.247	0.302	0.198
		W_2	0.108	0.245	0.321	0.137	0.256
		W_3	0.147	0.138	0.109	0.185	0.178
		W_4	0.184	0.225	0.115	0.156	0.132
External Factors	**Factor Weight**	**SWOT Sub-Factors**	**Sub-Factor Weight**	**Strategies**			
				SO	**ST**	**WO**	**WT**
Opportunities (O)	0.286	O_1	0.126	0.168	0.263	0.254	0.182
		O_2	0.241	0.136	0.156	0.124	0.105
		O_3	0.185	0.118	0.172	0.311	0.264
Threats (T)	0.124	T_1	0.167	0.178	0.193	0.165	0.231
		T_2	0.223	0.144	0.134	0.184	0.145
		T_3	0.265	0.308	0.128	0.173	0.163
		T_4	0.321	0.154	0.176	0.118	0.196
Strategies final weight		-	-	0.136	0.314	0.236	0.187

In the above part, ANP is used to rank the relative importance of its influencing factors. The ranking results shown in Tables 12–15 indicate that the impact of each factor on the development strategy of ecotourism varies significantly across the different PAs. To construct a four-half-dimension coordinate system (i.e., a strategic quadrilateral graph), four variables were employed, with the positive semi-axis represented by the overall

priority score of WT and SO and the negative semi-axis represented by ST and WO. This arrangement allowed for a comprehensive representation of the four variables in the coordinate system. The strategic quadrilateral graph (Figure 3) was formed by connecting the four points in a sequential manner, symbolising the SWOT-ANP strategies at each study site.

5. Discussion

Our research findings indicate that the most significant negative impacts of ecotourism are associated with physical and environmental aspects, especially because of the importance of these areas for sustaining biodiversity, their value as genetic resources, and the presence of natural and historic ecotourism attractions. Since sustainable ecotourism in PAs cannot succeed without considering human factors, we have also considered economic-institutional and socio-cultural dimensions. The complex, multi-dimensional nature of ecotourism impacts and their management was noted in numerous studies [45–47].

Jajrud has been exposed to high levels of change and severe destruction from human activities, population growth, and urbanisation. These findings are confirmed by other studies [29,48], which demonstrate that the development of economic and physical activities spans across fragmented habitats and has caused species extinction. Overall, the major challenge for Jajrud is its proximity to the metropolis of Tehran and the growth and development of human activities. Consequently, we propose "WT" strategies to reduce weaknesses and control threats in the area. This includes controlling and preventing the physical and economic exploitation of intervening organisations, the elimination of military activities and noisy vehicle traffic from this area to reduce stress levels in the fauna and prevent their displacement, and also enhancing the attractiveness of the area for tourists.

In Lar National Park, managerial objectives, legal bans, and protection measures have not been devised adhering to IUCN guidelines; thus, issues caused by human activities are prevalent. Previous studies, such as the one conducted by Jahani and Saffariha [49], have corroborated these findings. They have demonstrated that human activities, including overgrazing and the establishment of ecotourism ventures, have resulted in various impacts. Lar National Park shows high sensitivity and low levels of adaptation to the development of human activities [50]. Restrictions and legal measures established to protect the area have not been effective, as confirmed by the IUCN. "SO" strategies were thought to be optimal in this case, including the development of educational and research activities due to the presence of pristine habitat and high populations of *S. trutta fario*; furthering the development of sport-fishing in rivers due to the presence of valuable aquatic resources; and finally converting the area into a mountaineering hotspot to harness opportunities offered by Damavand Peak. At the same time, monitoring threats while increasing strengths and opportunities will be important.

In Tangeh Vashi, the combination of a large number of tourists flocking to the area (Table 1) without proper monitoring of the use of the many historical, natural, and cultural attractions has made ecotourism in this area unsustainable. "ST" strategies seem most prudent, as evidenced by their high score, to develop strengths and eliminate threats. This area shows the second highest ecological sensitivity after Lar and high levels of visitation to various natural, historical, and artificial attractions. Controlling the growth of scattered constructions in Tangeh Vashi to protect historical monuments and increasing a sense of safety for tourists by developing access to vital infrastructure will be important. Finally, in Kavdeh, wildlife hunting and habitat loss pose threats to be addressed through "ST" strategies, which aim to decrease conflicts between local communities and wildlife. To preserve the best habitats as wildlife refuges, ecosystem degradation needs to be managed along with vegetation loss, increased pollution, the development of scattered and unbalanced construction, and environmental hazards, as supported in other studies [51–53].

Overall, the uncontrolled and widespread development of tourism activities and the lack of partnerships between different organisations and a common agenda with a clear prioritisation of the most pressing issues have impacted all four PAs in our study. Strategic

planning will be essential to attract the support and cooperation of multiple agencies to sustainably harness ecotourism potential [54–56].

5.1. Research Implications

The suggested approach, along with the sustainable ecotourism outcomes it produces, was initially illustrated and defined through a case study conducted at the site level, focusing on different types of PAs. This process can be further expanded to encompass other ecological and geographical contexts. The ultimate goal is to develop a comprehensive and practical model that can be universally implemented in various PAs as ecotourism destinations in the future, ensuring its effectiveness and usefulness. The method employed in this study enables the objective consideration of the factors influencing ecotourism sustainability in different types of PAs in Iran. By combining qualitative and quantitative approaches, a comprehensive understanding of these factors is achieved. This implies that the method can be applied to other frameworks and regions, allowing for flexibility and broader applicability. The strategies obtained from our study can be potentially applied in regions that share similar characteristics to the studied region. In order to expand the applicability of the study method to other areas, it is crucial to adapt and redefine the SWOT factors and sub-factors to align with the unique characteristics of those specific areas.

5.2. Research Limitations and Future Works

It is important to acknowledge several limitations in our study. Firstly, the research may have limited generalizability as it primarily focuses on the sustainable determinants of ecotourism in Iran, specifically aligning with international guidelines. Secondly, the strategic elements identified in the study are derived from the viewpoints of a particular group of experts, and it is possible that the findings might differ when considering the perspectives of another subset of experts. To enhance the accuracy of factor weighting, it is recommended to employ other MCDM methods, such as Technique for Order Preference by Similarity to Ideal Solution (TOPSIS). Additionally, incorporating evaluations based on fuzzy logic is suggested to account for uncertainty in the analysis. In future research, the utilisation of multi-criteria decision-making models should encompass a diverse range of criteria. It is important to identify undiscovered attractions and incorporate updated methods such as artificial neural networks and support vector machines. By employing these advanced techniques, complex multi-criteria decisions can be made more accurately, enabling the identification of areas with untapped ecotourism potential.

6. Conclusions

PAs hold great potential for ecotourism development, and yet they are consistently challenged by the accompanying impacts. We used a SWOT-ANP analysis to demonstrate how this can be applied to select optimal strategies for the management of ecotourism destinations. Ultimately, it is crucial to implement appropriate strategies that leverage the strengths and opportunities while mitigating the weaknesses and threats to effectively develop ecotourism in PAs. We exemplified the utility of this approach for four PAs in Iran.

We found that for each type of PA in Iran, a different strategy should be selected for strategic planning and the development of sustainable ecotourism ventures. In Lar, aggressive strategies were chosen for the strategic planning and management of sustainable ecotourism ventures. In Jajrud, defensive strategies were considered to be the most effective. In the Tangeh Vashi and Kavdeh areas, diverse strategies were selected as the optimal choice for strategic planning and the development of sustainable ecotourism ventures. To protect these areas, a range of management measures were presented, such as the implementation of integrated management plans based on zoning guidelines, the establishment of better protection laws and regulations, and the development of partnerships and cooperation between organisations, local communities, and tourists.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/su151411013/s1. Table S1: Details of respondents (n = 40). Table S2: List of dimensions, variables, and indicators of negative impacts of ecotourism for four different Protected Areas in Iran. Table S3: Relative preference values for pairwise comparisons (adapted from Saaty, 1996). Table S4: Descriptive profile of the respondents. Table S5: Mean levels for ecotourism impact indicators (total = 66 indicators) based on 5-point Likert scale ratings (very low to very high) by tourism management experts (n = 40) for four different protected areas in Iran (first round of the Delphi method). Table S6: Mean levels for ecotourism impact indicators based on 5-point Likert scale ratings by tourism management experts (n = 38) for four different Protected Areas in Iran (second round of the Delphi method). References [57–82] are cited in the Supplementary Materials.

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