

SWOT ANALYSIS FOR THE DEVELOPMENT OF STRATEGIES TO DESIGN SUSTAINABLE TOURISM INDICATORS IN GALAPAGOS, ECUADOR

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ABSTRACT

Sustainable tourism provides social, environmental and economic benefits and is vital in natural areas. The Galapagos Islands represent a natural environment that integrates unique species of flora and fauna. The tourist growth of the islands, in addition to their fragility and vulnerability to anthropic activities, requires sustainable tourism approaches that promote ecological and social balance. This study aims to propose strategies for the development of sustainable tourism indicators by integrating a strengths, weaknesses, opportunities, and threats (SWOT) analysis based on the perception of key actors, such as municipal authorities, the community, academia and tourists in general, related to tourism and the environment. The methodological process addressed three main phases: (i) integration and analysis of tourism data; (ii) definition of questionnaires and key actors; and (iii) design of strategies to formulate sustainable tourism indicators. In general, SWOT analysis allowed us to define strategies aligned with three main aspects: (i) strengthening public policies and territorial planning; (ii) sustainable management of natural and geological heritage; and (iii) integration of academia to design environmentally and economically sustainable tourism strategies. This research provides tools for the use of strategies based on ecological, economic, and sociocultural criteria for decision-makers and short- and long-term tourism planning.

Keywords: environmental conservation, tourism management, sustainable development, management strategies, innovation in destinations.

1 INTRODUCTION

Tourism is considered a socioeconomic activity that contributes to reducing community poverty and promoting national socioeconomic development [1]. However, owing to its possible impact on the environment, experts in the field have focused on sustainable tourism as an inclusive notion that involves the environmental, social, economic, cultural, ethical, and political axes [2]. This type of socioeconomic activity reflects its importance in fulfilling the Sustainable Development Goals (SDGs) for 2030, thereby increasing the relevance of research in sustainable tourism [3].

In recent decades, the effects of overtourism have become evident with the increase in the number of tourists, mobility, and high demand for novel experiences, registering consequences for human and environmental well-being [4]. Additionally, alternative livelihoods, such as agriculture and fishing, are displaced in local communities, increasing their vulnerability to market volatility [5]. In protected areas, the sustainability of tourism is complex, and many researchers contemplate and promote forms of nature-based tourism with administrative and governmental support to preserve ecosystems and address the economic and social needs of local communities [6].

In this context, there is a clear need to strengthen tourism planning and development by adopting responsible and sustainable models and practices [7]. Sustainability indicators are



tools that allow for analysing and evaluating the sustainability of tourism in its environmental, economic, social, and political dimensions, as well as the interconnectivity between them [8]. The design of sustainable tourism indicators stimulates learning processes, improves understanding of social and environmental problems and needs, strengthens community capacities, and allows for the formulation of sustainable management and development strategies [9].

At the global level, there are a wide variety of studies on the design and evaluation of sustainable tourism indicators [10]–[12]. For example, in Taiwan, Lee and Hsieh [13] identified indicators for sustainable tourism in wetlands as valuable tools to strengthen the planning, management, and monitoring of sustainable tourism in this ecosystem. In Spain, Lozano-Oyola et al. [14] considered the proposal of indicators for cultural destinations as a critical aspect for formulating action plans and defining strategies.

The Galapagos Islands, located in the Pacific Ocean approximately 1000 km from the continental coast of Ecuador, are unique flora and fauna conservation sites on a global level, declared by UNESCO as a World Natural Heritage Site in 1978 and a Biosphere Reserve in 1987 [15]. 97% of the land area includes the Galapagos National Park [16], whereas the marine area is protected by the Galapagos Marine Reserve and the Hermandad Marine Reserve, where the land and marine areas are managed by the Galapagos Management Plan [17]. This area of global geological importance is a well-known tourist destination, where strategies to promote environmental conservation and community interests are constantly sought.

In the Galapagos Islands, tourism has been characterised by cruise tourism since its beginning, which, over time, has been transformed into an inclusive tourism model that integrates land tourism [18]. Under this management, the number of visitors has increased steadily, reaching 329,475 tourists in 2023, experiencing a 23% increase in total arrivals compared with 2022 [19]. The increase in the influx of tourists represents an environmental threat that, from 2007 to 2010, led the Ecuadorian government to declare the islands as in a state of emergency [20] and UNESCO to add them to the List of Natural Heritage in Danger [21]. This situation has generated the need to strengthen tourism management models towards a framework of a socio-ecological and sustainable system [22].

Since 2011, ecotourism models have been proposed for islands to integrate stakeholders and promote the implementation of plans and strategies that promote environmental conservation [20], [23]. However, with the COVID-19 pandemic, the collapse of tourism was evident, affecting the population that depended directly or indirectly on this industry, reflecting the need for more sustainable, inclusive, and resilient tourism planning and management [24]. 60% of the annual budget of the Galapagos National Park Directorate (DPNG, acronym in Spanish) is financed with income from entry fees from visitors arriving on the islands, intended to cover the needs of conservation and heritage protection [25].

Studies have been conducted based on indicators that serve as tools for decision makers in Galapagos in the implementation of policies towards adequate conservation management, such as Benítez-Capistros et al. [26], who identified the key environmental impacts of Galapagos and developed 37 comprehensive sustainability indicators using the Delphi method with the Drivers-Pressures-State-Impact-Response (DPSIR) framework. Martínez-Fernández et al. [27] created the Galapagos Water Indicators System (SIAG) and showed the interactions between water and other social and environmental components of the dynamics of the Galapagos, highlighting how tourism influences these factors. Espin et al. [28] mentioned some crucial social (employment rate, tourism income per capita) and ecological (introduction of invasive species, saturation of carrying capacity, land use) indicators to monitor and manage the balance between tourism and environmental conservation.



As tourism destinations seek to recover and adapt to internal and external factors in island ecosystems, there is a need to develop sustainable tourism indicator strategies post COVID-19, including the perspective of stakeholders related to the tourism sector in a protected island environment. In this context, the research question arises: How can strategies for sustainable tourism indicators be developed post COVID-19 based on the perception of key actors in protected island ecosystems? The present study aims to propose strategies for the development of sustainable tourism indicators in Galapagos by applying the strengths, weaknesses, opportunities, and threats (SWOT) method and semi-structured interviews based on the perception of key actors, such as representatives of municipal authorities, national park management, government agencies, community, academia, and tourists for the identification of the subsystems and their relationship with the tourism sector in the human–nature interaction in the post-pandemic scenario.

2 MATERIALS AND METHODS

The methodology is based on the construction of a case study [29] of sustainable tourism developed in the island ecosystem (Galapagos Island) combining qualitative tools such as SWOT analysis and in-depth semi-structured interviews that allowed the establishment of a conceptual system of environmental–social–economic–institutional coupling in tourism in the post COVID-19 scenario of the Galapagos Islands. The study phases are summarised in Fig. 1.

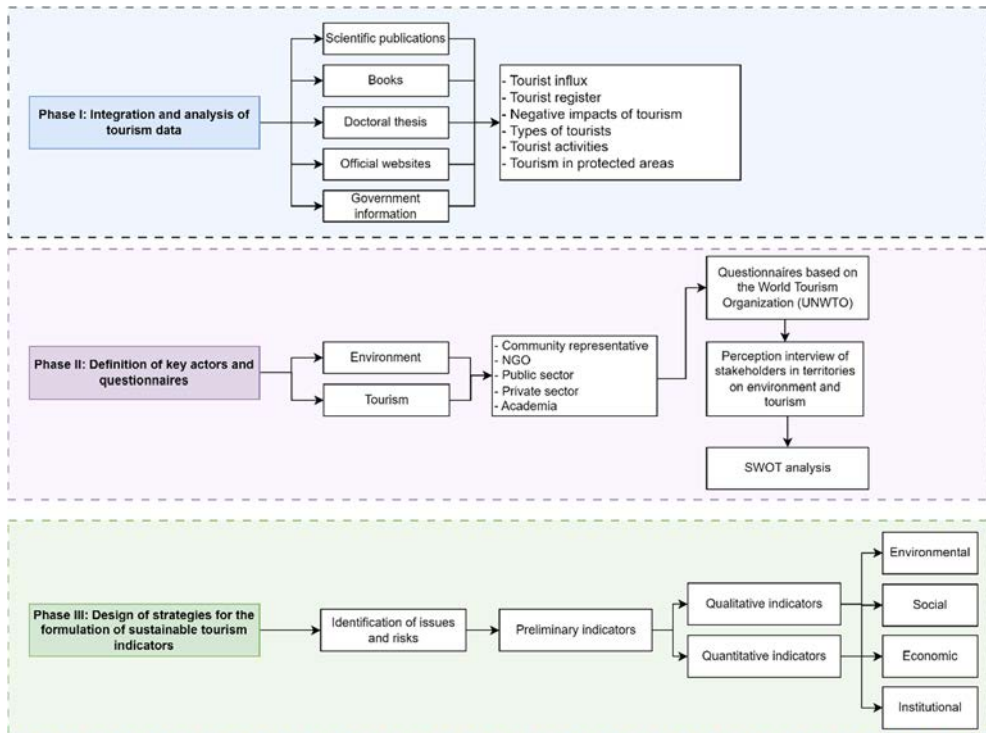


Figure 1: Study phases applied to case study.

2.1 Phase I: Integration and analysis of tourism data

The first phase includes the documentary analysis method [30], which is an iterative process of superficial reading, exhaustive reading and interpretation of the main primary and secondary sources available related to the tourism sector of the Galapagos. These include annual report on visitor influx to protected areas, load capacity and ecological sustainability, information on employment and working conditions, Galápagos 2030 Plan, Sustainable Development Plan and Territorial Planning of the Special Regime of Galapagos, active programmes developed by the Charles Darwin Foundation (CDF) (<https://www.darwinfoundation.org/en/>), demographic and socioeconomic information were provided by the National Institute of Statistics and Census of Ecuador (INEC) (<https://www.ecuadorencifras.gob.ec/censo-de-poblacion-y-vivienda-galapagos/>), Organic Law of the Special Regime in the Province of Galapagos and academic articles and theses on sustainable tourism and conservation in Galapagos.

The analysis of the information during this phase was verified and contrasted, determining the baseline in the tourism context of the case study, identifying the characteristics of the tourist destinations, roles of the interested parties, historical risks in the industry, initial contacts, and establishing potential key actors within the study. This qualitative analysis supports the design of indicators and establishes a conceptual model of the environmental–social–economic–institutional coupling in the tourism system.

2.2 Phase II: Definition of key actors and questionnaires

In this phase, the key actors were defined using the stakeholder strategy matrix model that determines the level of interest and power/influence of each potential stakeholder [29]. Additionally, a questionnaire was designed following the guidelines of the World Tourism Organization [30] using open questions categorised into (a) current state of tourism, (b) trends and risks, (c) tourist attractions and resources, (d) human resources and skills, (e) management and financing capacity, (f) tourism vision and community cohesion, (g) contribution of tourism to heritage development and (h) main environmental impacts. Fifteen in-depth semi-structured interviews were conducted in March 2022 in Spanish. To contact the actors, email was used, and in other cases, by phone, to confirm date and time availability in their agendas. The interviews had an average duration of 44 minutes. Each interviewee was informed of the purpose of the study and provided informed consent. Table 1 presents the details of each stakeholder (interviews) along with their role and interest/potentiality.

The SWOT analysis [33] of the current situation of the tourism sector was conducted using the information from the 15 interviews to identify the efforts made by tourism, tourism assets, and potential risks. The SWOT analysis assessed tourism potential and allowed us to define the types of indicators that will be useful to monitor the trends and progress of tourism objectives.

2.3 Phase III: Design of strategies for the formulation of sustainable tourism indicators

In this phase were evaluated the results of the previous qualitative analysis of the internal and external context of the tourism sector, and the most critical problems were determined, as well as those that may potentially require indicators. Thirteen qualitative and semi-quantitative indicators were established, focusing on the environmental, social, economic and institutional axes. Additionally, guidelines were provided for developing strategies in the four axes of the study.



Table 1: Participant for the Galapagos SWOT study.

Stakeholders	Number	Role	Interest/potentiality
Public administration: Tourism sector	3	Tourism sector actors	Development and management of tourism policies
Parish representative	1	Local community representative	Representation of local community interests
Galápagos National Park Directorate: Environmental	2	Environmental sector	Conservation and environmental management
Galápagos National Park Directorate: Tourism	1	Tourism sector	Sustainable tourism management
Private sector: Hotel industry	2	Hotel sector representatives	Accommodation services and tourism growth
Private sector: Travel services	3	Travel service providers	Tourist services and customer satisfaction
Private sector: Environmental NGO	1	Environmental NGO representative	Conservation and sustainable tourism advocacy
Academia: Research	2	Academic representative	Research and development in tourism and environment

3 RESULTS

3.1 Environmental–social–economic–institutional coupling in Galapagos tourism

Fig. 2 illustrates how tourism is positively or negatively related to various environmental, social, economic, and institutional components, including governance, population growth, immigration, employment generation, the introduction of invasive species, energy–water use, food production, waste, and employment. Each arrow indicates a specific relationship or impact between two components.

Following the pandemic, the tourism sector of the Galapagos Islands was forced to return to primary sector activities, such as fishing, agriculture, and livestock. According to the interviews, there was a phenomenon of migration to the mainland in search of economic sources, especially among tourist guides whose income is based on land and water tourism [31]. With the reactivation of tourism in June 2021, Fig. 2 identifies immigration in Galapagos as having a positive relationship with several factors (e.g., labour demand and population growth) driven by economic recovery, labour demand, and population dynamics. The negative relationships (black dashed lines) highlight the cycles considered in ‘equilibrium’ that stabilise the system by counteracting growth cycles. However, in the case of the ‘carrying capacity’ factor, it represents the need for continuous monitoring of the number of visitors to tourist destinations, the pressure of which has affected other island destinations around the world (e.g., Balearic Islands, Spain [32] and Jeju Island, South Korea [33]). Owing to their size and scale, island socio-ecological systems are more susceptible to external and internal pressures [34]. Tourist labour immigration is a relevant factor that



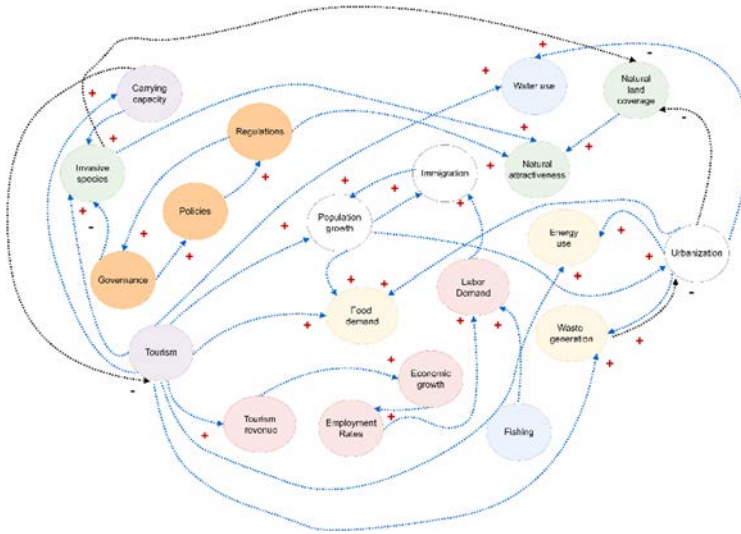


Figure 2: Conceptual model of the environmental–social–economic–institutional coupling system in Galapagos tourism.

activates population growth and negatively affects attractiveness and scenic value, especially in coastal areas. It is necessary to evaluate long-term pressures and create early ecological alerts for sustainable tourism development in island environments, such as case study.

3.2 SWOT analysis

The results of the questionnaires applied to the key actors in this study reflect, as internal aspects (Fig. 3), the tourism potential of the islands integrated with the actions of stakeholders based on adaptability and resilience to adverse economic, organisational, and climatic factors. However, the low level of community knowledge about sustainable tourism (e.g., [35]) and its dependence on tourism demand compromise alternative sources of socioeconomic development.

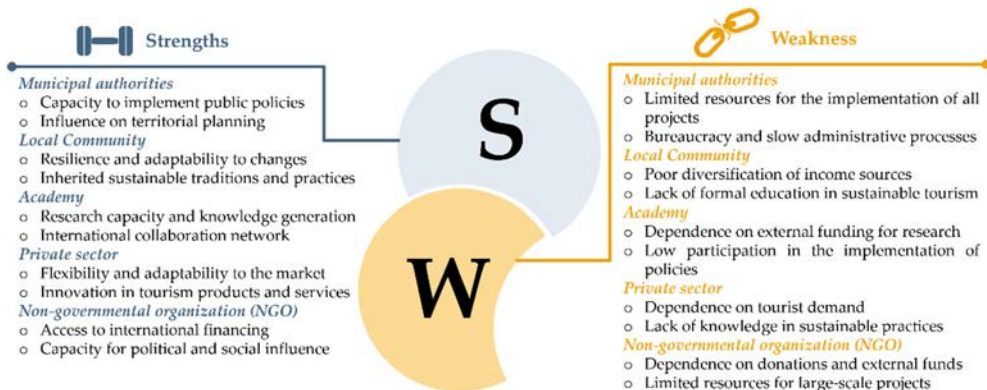


Figure 3: Main internal aspects of tourism development in Galapagos.

In contrast, the external aspects of tourism (Fig. 4) point to the foremost future opportunity to integrate key actors in reformulating public policies that consider the sustainable use of resources, land use, and tourism development plans to protect community interests and ecosystem conservation. However, the sustainable development of this activity is seriously threatened by the effects of climate change and the anthropogenic degradation of natural sites due to overtourism.

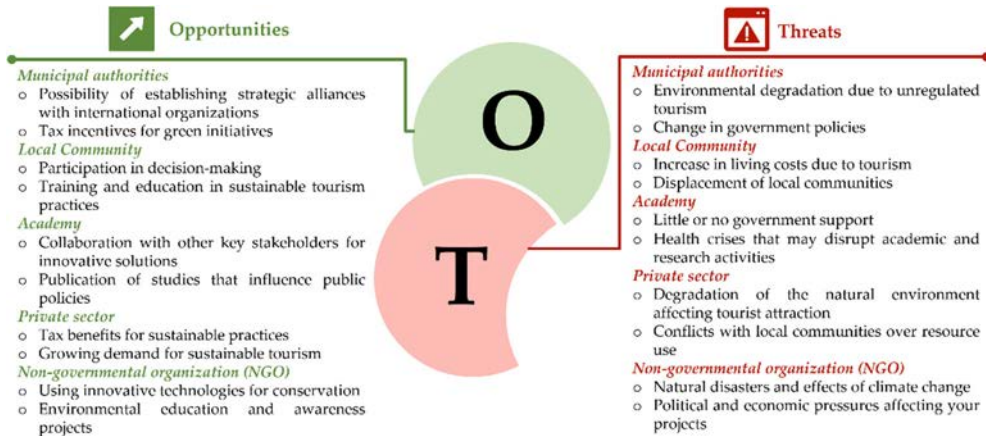


Figure 4: Main external aspects of tourism development in Galapagos.

Based on the SWOT analysis, this study proposes strategies to promote sustainable tourism development according to the type of key actor:

- **Municipal authorities:**
 - o Reformulation of policies that promote sustainable tourism practices, including tax incentives for businesses or communities that adopt innovative and environmentally friendly tourism approaches.
 - o Creation of inter-institutional committees/organisations that integrate key actors to strengthen cooperation and planning of tourism development, prioritising human well-being, and environmental conservation.
 - o Implement effective solid and liquid waste management systems in tourist areas as well as sustainable water resource management (e.g., [36]).
 - o Promote policies that encourage shorter tourist stays and reduce the environmental impact of different components of natural heritage.
 - o Implement stricter immigration regulation policies.
- **Local community:**
 - o Education and awareness programs for conservation strategies in island environments for tourists, agencies, and the community.
 - o Design socioeconomic development plans that promote the diversification of complementary or adaptable sources of income to tourism, such as agrotourism and geotourism [37], and increase community economic resilience.

- Academy:
 - Periodic studies on (i) the visitor management system of tourist destinations; (ii) tourist carrying capacity in sites of natural, geological, and cultural interest; and (iii) the environmental impact of tourist development works.
 - Promote the strengthening of strategic alliances for research projects on islands related to tourism and sustainable use of natural resources.
- Private sector:
 - Innovation in tourism products and services encourages the consumption of local products and supports the marketing of agricultural products in the tourism market.
 - The implementation of green technologies, resource conservation practices, and the creation of tourism experiences educate visitors about the importance of island sustainability.
- Non-governmental organisation (NGO):
 - Strengthening conservation and environmental monitoring projects that integrate community participation and tourists to mitigate the negative impacts of overtourism on the environment.
 - Microfinance initiatives and support for local entrepreneurs provide financial and training resources to strengthen the economy.

3.3 Proposal for sustainable tourism indicators in Galapagos

Table 2 shows the 13 proposed indicators that evaluate sustainable tourism development from different perspectives, including the environmental, social, economic and institutional dimensions. They are categorised into the well-being of host communities (E04, E05, S01, S02, S03), tourist satisfaction (E01, S04), health and safety (E01), environmental sustainability (E02, E03), carrying capacity management (S05), economic benefits of tourism (S01, EC01, EC02) and planning (I01).

4 DISCUSSION AND CONCLUSIONS

The methodological approach proposed in this study through in-depth semi-structured interviews and SWOT analysis allowed for the establishment of strategies for the development of 13 sustainable tourism indicators that address the environmental, economic, social, and institutional axes. The findings represent a key element that can help decision makers on the islands find solutions to the problems and conflicts, both real and potential, faced by tourism.

According to the SWOT analysis, in the context of the Galapagos Islands, implementing sustainable tourism strategies is essential for promoting the balance between socioeconomic development and environmental conservation. In this sense, local policies represent an axis that articulates correct tourism management from social, environmental, economic, and academic perspectives. The active participation of the community and private sector makes it possible to understand the importance of caring for nature and include sustainable tourism models such as agrotourism [5], [38] and geotourism [37] as resilient and replicable economic diversification models. The application of sustainable tourism indicators would contribute to the different efforts to improve the sustainability of the destination. The Canary Islands [39],



Table 2: Proposal for sustainable tourism indicators for the case study.

Axes	No.	Indicators	Time	Description	Verification method
Environmental	E01	Perception of sea water quality according to tourists	Quarterly	Measures tourists' satisfaction with the quality of sea water in the tourist destination	Satisfaction surveys
	E02	Percentage of visitors who receive information about sustainable tourism practices before and during their visit to the destination	Quarterly	Evaluate the effectiveness of information and educational campaigns on sustainable tourism.	Surveys or records of information activities
	E03	Fossil fuel consumption in the tourism sector	Annual	Quantify the consumption of fuels used for electricity generation.	ARCENNR reports*
	E04	Total volume of water consumed and litres per tourist per day	Monthly	Measures the total volume of water consumed by the tourism sector in a specific destination, divided by the number of tourists and the average number of days of their stay. It is expressed in litres per tourist per day.	Water consumption reports from hotels and other tourist facilities.
	E05	Volume of waste produced at the destination (tonnes) per year/person per year (per month)	Monthly and Annual	Measures the total amount of solid waste generated in a tourist destination for one year, as well as the amount of waste generated per person (inhabitant and tourist) in one month.	Environmental audit reports

Table 2: Continued.

Axes	No.	Indicators	Time	Description	Verification method
Social	S01	Percentage of people who believe that tourism has helped create new services or infrastructure.	Annual	Evaluates the perception of the local population on the benefits of tourism in terms of development of services and infrastructure.	Surveys of local residents
	S02	Percentage of sites with free public access to the local population	Annual	Evaluates the accessibility of tourist sites for the local population.	Surveys of local residents
	S03	Frequency of visits by the local population to the main sites.	Annual	Measures the frequency with which residents visit major tourist sites.	Check-in and surveys
	S04	Level of satisfaction of visitors upon leaving.	Monthly	Evaluates the overall satisfaction of tourists' experience at the end of the visit to the tourist destination	Tourist exit surveys
	S05	Percentage of tourists and residents who believe the destination is overcrowded.	Annual	Measures the perception of tourist overload among both tourists and residents of the islands.	Surveys for tourists and residents
Economic	EC01	Number of domestic and foreign tourist arrivals	Monthly	Total number of tourists arriving at the destination, broken down by national and foreign tourists.	Entry records and tourism statistics
	EC02	Locals working in the tourism sector.	Annual	Quantifies the number of local people employed in the tourism sector.	Employment records and labour surveys
Institutional	I01	Frequency of updating tourist plans.	Annual	Evaluates how frequently tourism development plans are reviewed and updated.	Workshop records

* Agencia de Regulación y Control de Energía y Recursos Naturales.



the Balearic Islands [40] and the Kangaroo Islands [41] have applied indicators with tangible results to help decision-making and curb the impact on the islands' resources.

The indicators proposed in this study are designed for islands but can be applied to any destination, making sustainable use of their resources through tourism. Future research should consider the perspective of the local community on the impacts generated by tourism activity on its environment, considering its fragility as a protected area.

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REFERENCES

- [1] Fauzi, M.A., Sustainable tourism and sustainable development goals (SDGs): A state-of-the-art review of past, present, and future trends. *Environ. Dev. Sustain.*, 2023. <https://doi.org/10.1007/s10668-023-04077-0>.
- [2] Moyle, B., Moyle, C., Ruhanen, L., Weaver, D. & Hadinejad, A., Are we really progressing sustainable tourism research? A bibliometric analysis. *J. Sustain. Tour.*, **29**(1), pp. 106–122, 2021. <https://doi.org/10.1080/09669582.2020.1817048>.
- [3] Nguyen, T.Q.T., Young, T., Johnson, P. & Wearing, S., Conceptualising networks in sustainable tourism development. *Tour. Manag. Perspect.*, **32**, 100575, 2019. <https://doi.org/10.1016/j.tmp.2019.100575>.
- [4] Milano, C., Novelli, M. & Cheer, J.M., Overtourism and tourismphobia: A journey through four decades of tourism development, planning and local concerns. *Tour. Plan. Dev.*, **16**(4), pp. 353–357, 2019.
- [5] Burbano, D.V. & Meredith, T.C., Effects of tourism growth in a UNESCO World Heritage site: Resource-based livelihood diversification in the Galapagos Islands, Ecuador. *J. Sustain. Tour.*, **29**(8), pp. 1270–1289, 2021. <https://doi.org/10.1080/09669582.2020.1832101>.
- [6] Boley, B.B. & Green, G.T., Ecotourism and natural resource conservation: the 'potential' for a sustainable symbiotic relationship. *J. Ecotourism*, **15**(1), pp. 36–50, 2016. <https://doi.org/10.1080/14724049.2015.1094080>.
- [7] Mostafanezhad, M. & Norum, R., The anthropocenic imaginary: Political ecologies of tourism in a geological epoch. *J. Sustain. Tour.*, **27**(4), pp. 421–435, 2019. <https://doi.org/10.1080/09669582.2018.1544252>.
- [8] Mendola, D. & Volo, S., Building composite indicators in tourism studies: Measurements and applications in tourism destination competitiveness. *Tour. Manag.*, **59**, pp. 541–553, 2017. <https://doi.org/10.1016/j.tourman.2016.08.011>.
- [9] Diéguez-Castrillón, M.I., Gueimonde-Canto, A. & Rodríguez-López, N., Sustainability indicators for tourism destinations: Bibliometric analysis and proposed research agenda. *Environ. Dev. Sustain.*, **24**(10), pp. 11548–11575, 2022. <https://doi.org/10.1007/s10668-021-01951-7>.
- [10] Font, X., Torres-Delgado, A., Crabolu, G., Palomo Martinez, J., Kantanbacher, J. & Miller, G., The impact of sustainable tourism indicators on destination competitiveness: The European Tourism Indicator System. *J. Sustain. Tour.*, **31**(7), pp. 1608–1630, 2023. <https://doi.org/10.1080/09669582.2021.1910281>.



- [11] Ivars-Baidal, J.A., Vera-Rebollo, J.F., Perles-Ribes, J., Femenia-Serra, F. & Celdrán-Bernabeu, M.A., Sustainable tourism indicators: What's new within the smart city/destination approach? *J. Sustain. Tour.*, **31**(7), pp. 1556–1582, 2023. <https://doi.org/10.1080/09669582.2021.1876075>.
- [12] Bošković, N., Vujičić, M. & Ristić, L., Sustainable tourism development indicators for mountain destinations in the Republic of Serbia. *Curr. Issues Tour.*, **23**(22), pp. 2766–2778, 2020. <https://doi.org/10.1080/13683500.2019.1666807>.
- [13] Lee, T.H. & Hsieh, H.-P., Indicators of sustainable tourism: A case study from a Taiwan's wetland. *Ecol. Indic.*, **67**, pp. 779–787, 2016. <https://doi.org/10.1016/j.ecolind.2016.03.023>.
- [14] Lozano-Oyola, M., Blancas, F.J., González, M. & Caballero, R., Sustainable tourism indicators as planning tools in cultural destinations. *Ecol. Indic.*, **18**, pp. 659–675, 2012. <https://doi.org/10.1016/j.ecolind.2012.01.014>.
- [15] Mateus, C. et al., Anthropogenic emission inventory and spatial analysis of greenhouse gases and primary pollutants for the Galapagos Islands. *Environ. Sci. Pollut. Res.*, **30**(26), pp. 68900–68918, 2023. <https://doi.org/10.1007/s11356-023-26816-6>.
- [16] Colloredo-Mansfeld, M., Laso, F.J. & Arce-Nazario, J., Drone-based participatory mapping: Examining local agricultural knowledge in the Galapagos. *Drones*, **4**(4), p. 62, 2020. <https://doi.org/10.3390/drones4040062>.
- [17] Ministerio del Medio Ambiente y Dirección de Parques Nacionales, Plan de Manejo de las Áreas Protegidas de Galápagos para el Buen Vivir. Puerto Ayora, Galápagos. Quito, Ecuador, 2014. https://www.galapagos.gob.ec/wp-content/uploads/downloads/2016/08/35_PLAN_DE_MANEJO_DE_AREAS_PROTEGIDAS_DE_GALAPAGO_S_PARA_EL_BUEN_VIVIR_22_jul_2014.pdf.
- [18] Epler, B., Tourism, the economy, population growth, and conservation in Galapagos. Galapagos Islands, Ecuador, 2007. <https://www.geog.psu.edu/sites/www.geog.psu.edu/files/event/coffee-hour/tourismreport1epler2007.pdf>.
- [19] Dirección del Parque Nacional Galápagos, Informe anual ingreso de visitantes a las áreas protegidas de Galápagos del año 2023. https://galapagos.gob.ec/wp-content/uploads/2024/03/INFORME_ANUAL_VISITANTES-2023_WEB-LQ.pdf.
- [20] García, J., Orellana, D. & Araujo, E., The new model of tourism: Definition and implementation of the principles of ecotourism in Galapagos. Galapagos Report 2011–2012, pp. 95–99, 2013.
- [21] UNESCO, State of conservation of properties inscribed on the list of world heritage in danger: Reactive monitoring mission. Report Galapagos Islands. 2007. <https://whc.unesco.org/en/soc/994>. Accessed on: 25 May 2024.
- [22] González, J.A., Montes, C., Rodríguez, J. & Tapia, W., Rethinking the Galapagos Islands as a complex social-ecological system: Implications for conservation and management. *Ecol. Soc.*, **13**(2), 2008. <http://www.jstor.org/stable/26267990>.
- [23] Pizzitutti, F. et al., Scenario planning for tourism management: A participatory and system dynamics model applied to the Galapagos Islands of Ecuador. *J. Sustain. Tour.*, **25**(8), pp. 1117–1137, 2017. <https://doi.org/10.1080/09669582.2016.1257011>.
- [24] Figueroa B.E., Rotarou, E.S., Island tourism-based sustainable development at a crossroads: Facing the challenges of the COVID-19 pandemic. *Sustainability*, **13**(18), 10081, 2021. <https://doi.org/10.3390/su131810081>.
- [25] Viteri Mejía, C. et al., Fishing during the 'new normality': Social and economic changes in Galapagos small-scale fisheries due to the COVID-19 pandemic. *Marit. Stud.*, **21**(2), pp. 193–208, 2022. <https://doi.org/10.1007/s40152-022-00268-z>.



- [26] Benítez-Capistros, F., Hugé, J. & Koedam, N., Environmental impacts on the Galapagos Islands: Identification of interactions, perceptions and steps ahead. *Ecol. Indic.*, **38**, pp. 113–123, 2014. <https://doi.org/10.1016/j.ecolind.2013.10.019>.
- [27] Martínez-Fernández, J., Esteve-Selma, M.Á., Banos-Gonzalez, I., Sampetro, C., Mena, C. & Carrión-Tacuri, J., Managing the Galapagos National Park: A systemic approach based on socio-ecological modeling and sustainability indicators. *Socio-Ecological Studies in Natural Protected Areas*, Springer: Cham, pp. 187–214, 2020. https://doi.org/10.1007/978-3-030-47264-1_11.
- [28] Espin, P.A., Mena, C.F. & Pizzitutti, F., A model-based approach to study the tourism sustainability in an island environment: The case of Galapagos Islands, pp. 97–113, 2019. https://doi.org/10.1007/978-3-319-99534-2_7.
- [29] Polonsky, M.J. & Scott, D., An empirical examination of the stakeholder strategy matrix. *Eur. J. Mark.*, **39**(9/10), pp. 1199–1215, 2005. <https://doi.org/10.1108/03090560510610806>.
- [30] World Tourism Organization, *Indicators of Sustainable Development for Tourism Destinations: A Guidebook (English version)*. World Tourism Organization (UNWTO): Madrid, 2004. <https://doi.org/10.18111/9789284407262>.
- [31] Burbano, D.V., Valdivieso, J.C., Izurieta, J.C., Meredith, T.C. & Ferri, D.Q., ‘Rethink and reset’ tourism in the Galapagos Islands: Stakeholders’ views on the sustainability of tourism development. *Ann. Tour. Res. Empir. Insights*, **3**(2), 100057, 2022. <https://doi.org/10.1016/j.annale.2022.100057>.
- [32] Amrhein, S., Hospers, G.-J. & Reiser, D., Transformative effects of overtourism and COVID-19-caused reduction of tourism on residents: An investigation of the anti-overtourism movement on the island of Mallorca. *Urban Sci.*, **6**(1), p. 25, 2022. <https://doi.org/10.3390/urbansci6010025>.
- [33] Kim, M., Choi, K.-W., Chang, M. & Lee, C.-H., Overtourism in Jeju Island: The influencing factors and mediating role of quality of life. *J. Asian Financ. Econ. Bus.*, **7**(5), pp. 145–154, 2020. <https://doi.org/10.13106/jafeb.2020.vol7.no5.145>.
- [34] Peterson, R. & DiPietro, R.B., Is Caribbean tourism in overdrive? Investigating the antecedents and effects of overtourism in sovereign and nonsovereign small island tourism economies (SITEs). *Int. Hosp. Rev.*, **35**(1), pp. 19–40, 2021. <https://doi.org/10.1108/IHR-07-2020-0022>.
- [35] Mestanza-Ramón, C., Chica-Ruiz, J.A., Anfuso, G., Mooser, A., Botero, C.M. & Pranzini, E., Tourism in continental Ecuador and the Galapagos Islands: An integrated coastal zone management (ICZM) perspective. *Water*, **12**(6), p. 1647, 2020. <https://doi.org/10.3390/w12061647>.
- [36] Carrión-Mero, P. et al., Water quality from natural sources for sustainable agricultural development strategies: Galapagos, Ecuador. *Water*, **16**(11), p. 1516, 2024. <https://doi.org/10.3390/w16111516>.
- [37] Carrión-Mero, P. et al., Geosites assessment in a volcanic hotspot environment and its impact on geotourism, Santa Cruz-Galapagos Islands, Ecuador. *Int. J. Geoh Heritage Park.*, **12**(1), pp. 147–167, Mar. 2024. <https://doi.org/10.1016/j.ijgeop.2024.01.006>.
- [38] Burke, A., The crossroads of ecotourism dependency, food security and a global pandemic in Galápagos, Ecuador. *Sustainability*, **13**(23), 13094, 2021. <https://doi.org/10.3390/su132313094>.
- [39] Schiemann, J.M., Towards a system of tourism indicators of sustainability for the Canary Islands. Lessons from INSTO-UNWTO [Hacia un sistema de indicadores de sostenibilidad turística en Canarias. Lecciones desde la Red INSTO-UNWTO], 2022. <http://riull.ull.es/xmlui/handle/915/31868>. Accessed on: 9 Sep. 2024.



- [40] Serra-Cantalops, A., Ramón-Cardona, J. & Vachiano, M., Increasing sustainability through wine tourism in mass tourism destinations: The case of the Balearic Islands. *Sustainability*, **13**(5), p. 2481, 2021. <https://doi.org/10.3390/su13052481>.
- [41] Higgins-Desbiolles, F., Death by a thousand cuts: Governance and environmental trade-offs in ecotourism development at Kangaroo Island, South Australia. *J. Sustain. Tour.*, **19**(4–5), pp. 553–570, 2011. <https://doi.org/10.1080/09669582.2011.560942>.

