Understanding Multi-stakeholder Complexity & Developing a Causal Recipe (fsQCA) for achieving Sustainable Ecotourism

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Abstract

Ecotourism offers several economic, environmental, and cultural benefits; however, even after all these years, achieving ecotourism sustainability is still complex because of multiple stakeholders with diversified interests and influence. This study focused on the multiple stakeholders’ complexity and management for achieving sustainable ecotourism in Penang Hill in Malaysia. Understanding the existence of multiple stakeholders with varying interests and their respective power of influence is critical for a tourism destination to be sustainable. This study aimed to create a multi-stakeholder management framework and understand stakeholder management’s mediating role toward ecotourism sustainability in Penang Hill. Data were collected from Penang Hill key stakeholders and analyzed using SmartPLS and fuzzy-set Qualitative Comparative Analysis (fsQCA). The findings revealed that stakeholder management plays a significant mediating role in achieving ecotourism sustainability. Stakeholders’ interests and their level of influence should be understood to develop engagement, empowerment, and monitoring strategies for managing stakeholders. Thus, the study contributes by validating the results through symmetric and asymmetric techniques, offering solutions to the emerging issues during the Covid-19 pandemic, and recommending policy changes. Lastly, the study also extends prior literature by displaying the mediating role played by stakeholder management on ecotourism sustainability, comparing indirect and total effects on stakeholder management support for achieving sustainable ecotourism in Penang Hill.

Keywords Ecotourism · Stakeholder management · Stakeholders · Interests · Stakeholders influence · Stakeholder theory
1 Introduction

Ecotourism has a substantial economic influence in today’s modern era (Abdullah et al., 2018). It generates employment for the destination and provides the community with an alternative source of income (Pongponrat & Chantradoan, 2012). The host region immensely benefits from ecotourism, but its effective execution is challenging due to the multi-stakeholder presence in an area (Üllenberg et al., 2015). Stakeholders have a considerable impact on the destination; thus, it is essential to know who they are and how to handle them. Therefore, achieving sustainable ecotourism without recognizing and managing the stakeholders is considered impractical. Stakeholder management is the practice of regularly defining, assessing, preparing, and executing actions to engage stakeholders (Freeman, 2010).

In the past, the term "stakeholders" was primarily used in the scope of organizational management. According to researchers, the organization’s settings are identical to the tourism destination’s, but the destination’s setting is a bit more nuanced and complex than the organization’s (Ryan, 2002; Getz and Timur, 2005). The primary purpose of stakeholder management in the tourist industry is that project planning and execution cannot occur without stakeholders’ involvement, including organizations, communities, and individuals who are directly affected by the project or who can affect project implementation (Bashir et al., 2012; Dabphet et al., 2012; Komppula, 2016; Lallicic, 2018). However, the dynamic tourism structure of a destination makes stakeholder management challenging. Moreover, studies have noted that many issues like degradation of destination, reduction of monetary benefits, natural resource degradation and failure to implement destination plan arise because of the lack of stakeholder management and collaboration in ecotourism destinations (Kenawy & Shaw, 2014; Osman et al., 2018). Even though stakeholder management and management policies are recognized as an integral step toward sustainable ecotourism (Getz and Timur, 2005), and several researchers have also stressed stakeholder management’s relevance to achieving sustainable ecotourism in the destination, however, ecotourism is considered difficult to implement and sustain for long term. This is because of the presence of multiple stakeholders in the destinations. Researchers such as Jaafar et al. (2021a, 2021b), Salman et al. (2020), and Salman Jaafar, and Mohamad (2021a), Salman et al. (2021), Salman, Kamerkar, et al. (2021)) have highlighted that multiple stakeholders can hinder ecotourism sustainability in the destination. Therefore, sustainable ecotourism is only achievable if all stakeholders are well managed and understood in terms of their interests and influence on the destination. The lack of stakeholder management discourages stakeholders from adopting ecotourism principles and contributes to substantial overlap and unwanted resource use in the destination (Salman et al., 2020).

Penang Hill, similar to other world-famous tourism destinations, consists of multiple stakeholders. However, to date, minimal studies have explored stakeholders’ perspectives, and is limited to the local community (Jaafar et al., 2021a, 2021b), conservation (Lowman et al., 2019) and sociocultural heritage development (Connolly, 2019) present on the Hill (Jaafar et al., 2021a, 2021b). This indicates a paucity of research and a gap to be filled for exploring the perspectives of other key stakeholders present in Penang Hill. Moreover, researchers such as Jaafar et al., (2021a, 2021b) also highlighted that the management authority of Penang Hill should investigate the relationships between stakeholders participation and engagement in the sustainability of Penang Hill quantitatively. The researchers mentioned above also recommended exploring other stakeholders’ perspectives to better understand Hill’s stakeholders.
Most importantly, to implement sustainable ecotourism in the destination, a framework is required that incorporates diverse actors and agencies to achieve broad outcomes that support conservation and development aims. Studies conducted by Pasape et al. (2013), K.C. (2016), Ubaidillah et al. (2018) and Wondirad et al. (2020) also noted that successful ecotourism implementation requires a proper framework, but stakeholders issues such as their diversified interests and level of influence hamper its success. Penang Hill is also facing these issues, and currently, there is no specific framework for managing stakeholders for implementing long-term ecotourism sustainability. However, a study conducted by Jaafar et al., (2021a, 2021b) highlighted that sustainability issues could be resolved using a well-defined framework, reviewing the policies and coordinating with stakeholders. Moreover, from Penang Hill’s perspective, no study has covered multi-stakeholder management based on the stakeholders’ interests and influence for achieving sustainable ecotourism. This indicates that there is scope for further research to help achieve sustainable ecotourism in Penang Hill. Therefore, to address this gap, the study will address two research objectives: (1) to implement a sustainable ecotourism framework by managing stakeholders and (2) To analyze whether stakeholder management mediates the relationship between stakeholders’ interests and stakeholders influence on the sustainable ecotourism. The study does this by evaluating the framework by running PLS and also exploring causal recipes (predictors) by using fsQCA. While previous studies utilized symmetrical approaches (e.g., SEM, correlation, regression) to identify the factors and to test the framework, there is a lack of studies that combine both the symmetrical and asymmetrical approaches to implement and achieve long-term ecotourism sustainability. Therefore, identifying a framework and presenting causal recipes by using fsQCA will be another significant contribution of this study and the findings of the study will be greatly valuable for understanding and achieving sustainable ecotourism in destinations such as Penang Hill.

2 Literature review

2.1 Stakeholder theory—an overview

In the 1980s, the stakeholder theory was established for the field of business and management (Freeman, 2010). The principle of fairness underpins stakeholder theory, implying that all parties should be treated equally and that their interests should be factored equally over the course of a project (Phillips, 1997; Phillips, 2003). Stakeholder theory proposes grouping stakeholders into two primary classes (Kenawy et al., 2017; Waligo et al., 2013) that are (1) primary stakeholders and (2) secondary stakeholders.

Primary stakeholders, also known as the key stakeholders, are those stakeholders without whose involvement, institution or initiative would cease to exist or cannot survive (Riahi, 2017; Waligo et al., 2013). Secondary stakeholders have an impact on or are affected by the organization, but the success or survival of a project is not contingent upon secondary stakeholders (Byrd, 2007; Riahi, 2017). Similar to the organizations, these primary and secondary stakeholders are also present in a tourism destination and stakeholder theory plays a key role in understanding them.
2.2 Stakeholder theory in tourism

Researchers have been attempting to integrate stakeholder theory into tourism since the early twentieth century to better understand the stakeholders involved in the tourism destination (Byrd and Gustke, 2011; Nicolaides, 2015; Mccomb et al., 2017). Stakeholders are the most influential players in the destination’s long-term tourism development. Therefore, their management is vital to the destination’s success (Backman & Munanura, 2015; Lyon et al., 2017).

Stakeholder theory influences the growth of ecotourism because it assists in identifying the core stakeholders engaged in preparation and decision-making, resulting in a simpler, more participatory, and mutually acceptable sustainable ecotourism process for all parties interested in the destination (Céspedes-Lorente et al., 2003; Sheehan & Ritchie, 2005). The tourism destination’s planners and developers have also noticed that the region’s policy development must include a diverse range of stakeholders who are affected by ecotourism development (Fennell, 2003). Thus, stakeholder theory helps develop a management framework consistent with the principles and ethics of the sustainable development model (Getz, 2005).

Another valuable aspect of this theory is that it provides the perspective of all stakeholder groups existing in the destination concerning decision-making and effective resource management in the region (Moswete et al., 2012). Stakeholder theory guides in identifying the interests, stakes and influence of the stakeholders participating in the tourism destination (Chan & Bhatta, 2013; Harrison, and Freeman, 2015; Noto & Noto, 2019). Including stakeholders’ interests and understanding their impact during the development and strategic planning of ecotourism at the destination is essential to achieve sustainable ecotourism. Treating all stakeholders with equal consideration, importance, and equality would create synergy for a successful project (Tantalo & Priem, 2016). Byrd (2012) noted that the critical component of stakeholder theory is identifying the common goals and understanding stakeholders’ impact, from which stakeholders can be best handled. Stakeholder management depends heavily on stakeholder theory for developing strategic management strategies (Freeman, 2015; Eskerod & Huemann, 2013; ElWakeel and Andersen, 2019). Stakeholder theory can contribute significantly to understanding stakeholder management processes and achieving sustainability. With stakeholder theory support, stakeholder interests, expectations, and power may be identified to better manage stakeholders.

2.3 Understanding theoretical framework

2.3.1 Stakeholders interest

Stakeholders actions are defined by their interest in a project (Kenawy et al., 2017). The significance of stakeholders is not determined by their possession of money or information, but by their duties, contributions, and stakes in the destination’s sustainable development (Getz & Timur, 2005; Nicolaides, 2015). Interest from stakeholders may often be determined by how much harm or benefit the project can provide. The higher the interest in the project among stakeholders, the more likely they are to participate in it. Stakeholder interest can vary due to various factors, including project ownership, values, legal arguments, financial rewards, and some risk and return. Additionally, stakeholder theory demonstrates that stakeholders’ interests are not just economic, but that many stakeholders have other
tangible interests (Agüera, 2013). After analyzing the past literature, researchers defined various types of stakeholders interests in sustainable tourism (Harilal & Tichaawa, 2018; Saidmamatov et al., 2020; Salman et al., 2021; Salman Jaafar, & Mohamad, 2021; Salman, Kamerkar, et al., 2021) as (1) Materialistic interests, (2) Sociocultural interests and (3) Environmental interests.

Understanding that stakeholders’ interests differ among and within the groups is important for a tourist destination (Salman et al., 2021; Salman Jaafar, & Mohamad, 2021; Salman, Kamerkar, et al., 2021). Diverse stakeholder interests may obstruct the identification of activities and distort collective efforts, culminating in project failure (Nicolaides, 2015). Rajablu et al. (2015) reported that stakeholder interests play a critical role in stakeholder management to achieve project success. Furthermore, addressing and recognizing diverse stakeholders helps contribute new recommendations, acquire support, be fair to all, strengthen the project, and avoid challenges like stakeholder opposition or disinterest (Lecuyer et al., 2018; Osman et al., 2018). Collaboration among stakeholders from various fields with varying interests will result in integrative and comprehensive approaches to sustainable growth and policy development (Lee, Kim, and Kwon, 2017). In order to fully grasp the viability of sustainable tourism, a strategic preparation can be done to foresee future obstacles and identify the most efficient solutions.

Not managing stakeholders according to their interests, where each stakeholder tries to influence others to gain his interests is one of the primary reasons for conflict (Herlangga and Basuni, 2019). Stakeholders are considered vital for implementing sustainable ecotourism in the destination (Cobbinah et al., 2015; Pasape et al., 2013; Wondirad et al., 2020). Past literature also notifies that a tourist destination’s sustainability depends on stakeholders and their interest in the destination (Cobbinah et al., 2017; Wei & Yang, 2013). Ecotourism destinations will not last long-term if stakeholders do not have any interest or involvement in them (McComb et al., 2017). Studies have described difficulties in identifying problems and achieving common interests among stakeholders as the key obstacle to sustainable ecotourism (McComb et al., 2017; Mihalic, 2016). Additionally, prior studies have demonstrated that stakeholders’ levels of interest and capacity to govern fluctuate over time (Berardi, 2013) which can further impact ecotourism sustainability in the destination.

Similar interests among stakeholders from different groups are said to positively impact achieving better results in a tourism destination (Butler, 2018; Rowley & Moldoveanu, 2003). If the interests are critical, stakeholders are more inclined to defend them (Rowley & Moldoveanu, 2003; Krce Miocic, Razovic, and Klarin, 2016). Examining stakeholders’ interests that can change the outcome and aid in the growth of sustainable ecotourism in the region can make the implementation of sustainable tourism smoother (Das & Chatterjee, 2015). This is vital, especially after the Covid-19 pandemic. The pandemic has affected everyone and everyone interests have shifted according to their priorities. Since stakeholders with robust interests may have a significant impact on the project, stakeholder interests can be integrated to guide adequate stakeholder management, which led to the development of the first hypothesis of the study which was.

**H1** Stakeholder interest will have significant relationship to stakeholder management.

### 2.3.2 Stakeholder influences

Stakeholder influence is described as a stakeholder’s degree of impact and engagement in a project to bring about the desired change (Eskerod & Huemann, 2013). Freeman (1999)
describes stakeholders influence as a series of actions taken by stakeholders to achieve their goals. This also assists in identifying a deep association between stakeholders’ interests and their influence. Stakeholder influence has historically been used as a key method in sustainable development research to assess and explain the influence stakeholders have on planning and decision-making (Lyon et al., 2017). Stakeholders’ interests and influence are related because, to exert influence over a project, stakeholders must be deeply committed to and interested in the issues and actions that occur inside it (Dunham et al., 2006; Yang, 2014). Multiple stakeholders’ influence on a tourist destination may be calculated by their power and network inside the destination (Salman, Jaafar, and Mohamad, 2021). There are several ways that stakeholders may influence the development of sustainable ecotourism in a tourism location, including the supply and demand of tourists, tourism policies, the management of tourism destination, and human capital. Through networking, stakeholders could form local, state, global, and foreign action groups to impact the project’s activities and decision-making. Additionally, they may form partnerships and affiliations to have a more significant effect and power in the destination (Voss, 2014). It is vital to understand stakeholder influence to promote environmental sustainability in the destination. Stakeholder theory, the leading theory behind this study, also acknowledges that there are many parties involved and that acknowledging their interests and influences is vital for project progress and long-term sustainability in the region (Chen & Liu, 2017; Waligo et al., 2013) which led to the second hypothesis of this study.

H2 Stakeholder influence will have a significant relationship to stakeholder management.

2.3.3 Ecotourism and stakeholder management

The idea of ecotourism arose due to the detrimental consequences of mass tourism and increasing environmental consciousness (Coria & Calfucura, 2012; DAM, 2013; Nigar, 2018; Picard, 2015). International Ecotourism Society (2015) defined ecotourism as "responsible travel to natural areas that conserves the environment, sustains the well-being of the local people and involves interpretation and education" (The International Ecotourism Society, 2016). Ecotourism has seen numerous variations throughout history and even after all these years, its sustainability is still problematic (Cohen & Cohen, 2012; Walker & Moscardo, 2014). Researchers have discovered that stakeholders interests and their level of influence can make ecotourism destinations successful or a failure (Ayachi & Jaouadi, 2017; Rivera and Gutierrez, 2019). Multi-stakeholders’ management and collaboration are key ideologies in sustainable ecotourism (Lee, 2001; Tseng et al., 2019). Stakeholders like local people, governments, and non-governmental agencies, and visitors all need to work together to develop the area and protect environmental resources. If ecotourism is adopted and sustained, it can also produce economic gains for the community, support and safeguard the environment, raise public awareness, and protect the ecosystem (Salman et al., 2020). Stakeholder management plays a key role in achieving long-term ecotourism success in the destination.

Management of the numerous stakeholder groups and coping with their concerns may take place at the global, state, and local levels and is typically coordinated by several different organizations (Nicolaides, 2015). Inaccessibility to certain stakeholders within the tourism system leads to teamwork issues, which continues to be a barrier to management techniques being employed (Van Cuong et al., 2017). Before implementing a management plan, it is essential to identify the stakeholders’ interests.
and concerns. Stakeholders, who exert the most significant control tend to be the most powerful, are more influential and are accompanied by stakeholder groups with lesser impact and less interest (WBR, 2017; Yang, 2014). Research conducted by Salman et al. (2020) highlighted that proper stakeholder participation and management are essential to ecotourism success. It was also found that the involvement of stakeholders is vital to stakeholder management. Past literature also points out that stakeholder management can be done by engaging stakeholders according to their interests and influence capability (Kent et al., 2012; Rajablu et al., 2017). Failure to properly manage stakeholders according to their interests and influence creates a lack of trust among stakeholders (Ayala-Orozco et al., 2018; Ruiz-Mallén et al., 2015). It limits their understanding of the perception of their power and their relationships. Inability to consider stakeholders’ interests and impact would establish a misunderstanding and tension between stakeholders and ultimately affect the success of the ecotourism destination. For stakeholder management to be efficient, it is vital for researchers to understand that stakeholders have competing interests and possess various influences on the project.

Furthermore, stakeholder management positively influences the success of a project (Francisco de Oliveira & Rabechini, 2019). Researchers such as Manowong and Ogunlanas (2010), Lyon et al. (2017) and Litheko and Potgieter (2019) highlighted that when stakeholder management is not done properly, perceptions of it deteriorate, chances of attaining goals decrease, and additional opportunities for interacting with stakeholders for the benefit of the project are significantly diminished. Thus, ecotourism sustainability can be easily hampered due to poor stakeholder management. Additionally, the ambiguity in stakeholder management practices hampers ecotourism implementation and sustainability (Su et al., 2014) which has been reported in the case of Penang Hill as well (Jaafar et al., 2021a, 2021b). Considering the historical significance of Penang Hill as a tourist destination, the management of primary stakeholders can pave the way for implementing sustainable ecotourism (Lowman et al., 2019). Therefore, effective implementation of ecotourism necessitates recognizing the diverse interests and needs of multiple stakeholders of the destination. However, a dearth of research is noted regarding stakeholder management and sustainable ecotourism, especially when it comes to a famous destination such as Penang Hill. This leads to the development of the last two hypotheses for this study which are.

**H3** Stakeholder management will have a significant relationship with sustainable ecotourism.

**H4** Stakeholder management mediates the relationship between stakeholders interests and stakeholders influence toward sustainable ecotourism.

Stakeholder management can be done by engaging stakeholders, empowering stakeholders, monitoring and controlling the stakeholders (Francisco de Oliveira & Rabechini, 2019; Salman, Jaafar, and Mohamad, 2021). A study conducted by Hollebeek et al. (2022) highlighted that stakeholders engagement guides to understand stakeholders cognitive and behavior roles. Therefore, it is vital to identify and categorize them. For this study, the stakeholders are categorized into three categories as highlighted in Table 1. The following section will explain the methodological choices made in this study.
3 Methodology

3.1 Study area

Penang Hill was founded in the year 1800 and is Malaysia’s oldest hill resort. Penang Hill is a central focus of Malaysian tourism and a proud heritage for the people of Penang Island. It is one of the few natural vegetation habitats in Penang, Malaysia. Today, the primary reason for tourists to visit Penang Hill is the cooler weather and the view of the gorgeous city of George Town from many points around the Hill. Penang residents are thrilled to enjoy the breeze on the Hill and are eager to take in the sweet music of the bird and animal sounds. Penang Hill’s main natural habitat is composed of forests. However, not all of the forests are in pristine condition, since some have previously been disturbed and are in a degraded state. This region is covered by existing Forests (full of biodiversity), water catchment areas, and national park boundaries. A large number of Malaysian plant species were found on Penang Hill. This also supports the case for protecting these animals and ecosystems in Penang Hill.

Bridle trails located on the eastern slope of Penang Hill could probably serve as an important conservation site for flora. This location is biologically noteworthy because of the wide variety of plants that are found here. In addition to Penang Hill, streams on the island of Penang would also be excellent locations for plant protection. The rocky streams of Penang Hill are home to some of the uncommon flora. Because of their importance in supporting a diverse flora, these rugged, rock-strewn streams have historically been considered to be an essential home for several rare plants, including several orchids, such as the exquisite white orchid *Zeuxine rupestris*. These diverse plant types and accompanying tree canopies, as well as the stream system as a whole, must be permitted to continue in its original, undisturbed state to maintain the shady and chilly, damp environment that these types of plants need.

3.2 Measurement

This research followed a quantitative approach. The researchers used a questionnaire with various items and constructs adapted from existing literature with Stakeholder interests (3-constructs), stakeholders influence (2-constructs), stakeholder management (3-constructs) and sustainable ecotourism (3-constructs) were measured and adapted using the established scales with the field of tourism and sustainability (Umutoni, 2014; Cheung & Jim, 2013; Harilal & Tichaawa, 2018; Hatipoglu et al., 2016; Jayasuriya et al., 2020; Liou, 2013; Pasape et al., 2013; Rajablu et al., 2015; Saidmamatov et al., 2020; Wishitemi et al., 2015; Adongo and Kim, 2018; Pasape et al., 2013; Harilal & Tichaawa, 2018; Aziz et al., 2015; Tsaur et al., 2006; Liou, 2013).
Phone calls were put across to the respondents’ organizations where the availability of the respondents was confirmed for questionnaire distribution. Upon arrival, the contact person introduced the researcher to respondents who were in contact and working with Penang Hill Corporation. The researcher explained the study and questionnaire, where the questionnaires were then handed over to the contact person for distribution. The contact person distributed the questionnaire to the respondents, and a one-week timeline was given to complete the questionnaire. Upon completion, the contact person from the specific organization then contacted the researcher for collection. The researcher then collated the completed questionnaire for final use.

Participants were asked to respond to each questionnaire item on a five-point scale indicating their agreement or disagreement (1 = strongly agree to 5 = strongly disagree). Because of the nature of this study, the questionnaire was conducted with the primary stakeholders of Penang Hill only. The minimum sample size for this study was determined using G*Power. The program calculated the minimum sample size to be 68 using an effect size of 0.15, 0.80 statistical power, and a significance level of 0.05. In the bid to ensure a high level of representativeness, improved statistical power in the analysis, obtain more reliable data from the limited sample size, census sampling method was applied by sending the questionnaire to all 124 potential respondents to participate in the survey. This is also in-line with the studies conducted by Zailani et al. (2017), Ntloko (2016) and Sucheran and Arulappan (2020), where the researchers highlighted that due to low sample size, the census method can help to get reliable data and findings. Moreover, this strategy is also to accommodate the poor response from the respondents in-line with Abdul-Aziz and Kassim (2011) and Ebekozien (2019).

### 3.3 Data collection

A questionnaire was used to collect data from the key stakeholders of Penang Hill. The list of the key stakeholders was received from the management authority of Penang Hill. For this segment, the population includes stakeholders working with Penang Hill. The study respondents included specific personnel assigned with dealing related to Penang Hill. The respondents belonged to the government sector, the local community and the private sector. Data were collected between September 2020 and January 2021.

Participants from Penang Hill’s demographic makeup were distributed as follows: 82.5% (male), 17.5% (female); 28–25 (3.8%), 26–35 (37.5%), 36–45 (42.5%), 46–55 (12.5) years of age; and completed diploma (25%), degree (37.5%) and postgraduate (37.5%). Out of the 124 questionnaires administered, 106 questionnaires were returned where 26 questionnaires were rendered unusable. A total of 80 questionnaires were validated and used for analysis, representing a 64.5% response rate. This response rate is in-line with Akintoye and Fitzgerald (2000) suggestion where the 20–30% benchmark with questionnaire surveys of the construction industry should be accepted and considered satisfactory. The adoption of 10.4% and 41.4% response rates by Abdul-Aziz and Kassim (2011) and Ebekozien (2019), respectively, also validates the acceptance of this study’s response rate. Therefore, a total of 80 questionnaire responses were used for this study. SmartPLS 3.3.3 was used to conduct data analysis (Ringle et al., 2015).
3.4 Data analysis method

PLS-SEM was used to assess the measurement and structural model for this study because PLS-SEM can be used to test reflective, formative or complex reflective-formative models (Hair et al., 2017). The primary focus was on ensuring the consistency of the variables’ reflective constructs. Both the structural model and measurement models were tested for reliability, validity and predictive capability of the model. Furthermore, fuzzy-set Qualitative Comparative Analysis (fsQCA) was subsequently conducted to explore the combinations of dimensions (causal recipes) that can guide toward achieving and implementing sustainable ecotourism. fsQCA is a set-theoretic approach that can guide to achieving ecotourism sustainability by exploring complex conditions through stakeholder interests, influence, and management. Three steps involved in the fsQCA namely data calibration, truth tabulation analysis and counterfactual analysis helps to refine probable conditions and select different algorithms to generate the outcomes (Olya et al., 2020). Two measurements of "consistency" and "coverage" called "consistency" and "coverage" are used to enhance the algorithms generated by fsQCA, which are similar to "correlation" and "determination coefficient," respectively (Olya & Mehran, 2017). An analysis of necessary conditions was also carried out to determine which components are required to improve guest satisfaction and loyalty. Analysis of Necessary Condition is more focused on assessing the contribution of only necessary conditions to a certain result (Olya & Han, 2020). The findings of the necessary condition analysis assist policymakers and decision-makers in focusing solely on the necessary predictors for implementing ecotourism in the destination.

4 Results and findings

4.1 Measurement model assessment

The researchers started by looking at the outer loadings of the items that were associated with each construct. Additionally, composite reliability (CR) and average variance extracted (AVE) were examined (Gannon et al., 2017). The loadings, CR, and AVE should be greater than 0.7, 0.7, and 0.5, respectively, to establish convergent validity and reliability (Ali et al., 2018). However, if the CR and AVE values are within the threshold values, loadings between 0.5 and 0.7 are also acceptable (Hair et al., 2017). Table 2 provides the results of all reflective constructs for the measurement model testing phase, indicating that the reliability and convergent validity are established for the data collected for this study.

In the next step, the discriminant validity of the data was tested. Fornell–Larcker criterion and Heterotrait-monotrait (HTMT) approaches were utilized (Voorhees et al., 2016). According to the literature, acceptable HTMT values can be lower than 0.85 or 0.9 (Henseler et al., 2015), and the values obtained from this study also indicated that the HTMT values were within the threshold values (Table 3). The results show that the square root of the AVE for each construct is greater than its correlation with all other constructs, indicating discriminant validity for this study, as Fornell and Larcker (1981) predicted (Table 4).
Table 2 Results: Assessment of measurement

| Construct                  | Items | Loadings | CR  | AVE  |
|----------------------------|-------|----------|-----|------|
| Stakeholder Interests (SI) |       | 0.938    | 0.506 |
|                            | EN1   | 0.537    |      |
|                            | EN2   | 0.756    |      |
|                            | EN3   | 0.761    |      |
|                            | EN4   | 0.716    |      |
|                            | EN5   | 0.719    |      |
|                            | EN6   | 0.753    |      |
|                            | EN7   | 0.763    |      |
|                            | MT1   | 0.724    |      |
|                            | MT3   | 0.647    |      |
|                            | MT4   | 0.755    |      |
|                            | MT5   | 0.651    |      |
|                            | SC1   | 0.729    |      |
|                            | SC2   | 0.622    |      |
|                            | SC3   | 0.678    |      |
|                            | SC4   | 0.810    |      |
| Stakeholders influence (SF)|       | 0.898    | 0.502 |
|                            | N1    | 0.582    |      |
|                            | N2    | 0.649    |      |
|                            | N3    | 0.845    |      |
|                            | N4    | 0.833    |      |
|                            | N5    | 0.786    |      |
|                            | P1    | 0.787    |      |
|                            | P2    | 0.651    |      |
|                            | P3    | 0.550    |      |
|                            | P5    | 0.606    |      |
| Stakeholder Management (SM)|       | 0.927    | 0.516 |
|                            | SM1   | 0.773    |      |
|                            | SM10  | 0.664    |      |
|                            | SM12  | 0.698    |      |
|                            | SM14  | 0.671    |      |
|                            | SM2   | 0.789    |      |
|                            | SM3   | 0.776    |      |
|                            | SM4   | 0.621    |      |
|                            | SM5   | 0.799    |      |
|                            | SM6   | 0.765    |      |
|                            | SM7   | 0.745    |      |
|                            | SM8   | 0.654    |      |
|                            | SM9   | 0.638    |      |
| Sustainable Ecotourism (SE)|       | 0.874    | 0.584 |
|                            | SE1   | 0.621    |      |
|                            | SE2   | 0.830    |      |
|                            | SE3   | 0.860    |      |
|                            | SE4   | 0.726    |      |
|                            | SE5   | 0.760    |      |
4.2 Structural model

The structural model shows the relationships between the constructs in the proposed study model. Table 5 represents the results of the hypothesis assessment for this study. The results highlight a significant effect of stakeholder management on sustainable ecotourism. Moreover, the results also indicated the support for stakeholders' interests (SI) and stakeholders influence (SF) on stakeholder management (SM). \( R^2 \) is highly dependent on the research area. Cohen (1989) suggested that the values of 0.02, 0.13 and 0.26 be considered substantial, moderate and weak, respectively. Additionally, Hair et al. (2011) also noted that \( R^2 \) results of 0.20 are considered as substantial in some disciplines. The \( R^2 \) values of the endogenous variables for this study ranged from 0.492 to 0.585 which can be considered to be high and acceptable.

The direct relation between Stakeholder Management—> Sustainable ecotourism at \( \beta = 0.518, t = 3.669^{**} \) was found to be significant. The direct relation between stakeholder influence—> Stakeholder Management at \( \beta = 0.491, t = 4.550^{**} \) was also significant. The relation between stakeholder influence—> Sustainable ecotourism at \( \beta = -0.012, t = 0.087 \) with \( p \)-value > 0.05 was not significant. The results indicated that there is no significant direct relationship between stakeholders influence toward achieving sustainable ecotourism.

The product coefficient approach (indirect effect) was used to test the potential mediation effects, with bias-corrected bootstrap confidence intervals (CIs) being used to assess the significance of indirect effects. The results in Table 6 confirm the mediation role of stakeholder management between stakeholders interests and stakeholders influence on sustainable ecotourism. The indirect effects at 95 percent confidence interval BC (LL = 0.105 and UL = 0.461) and (LL = 0.075 and UL = 0.417) did not straddle a zero, indicating a mediation (Preacher & Hayes, 2008). As a result, it was
### Table 5  Results structural model

| Hypothesis | Path | Beta  | Std. Error | t-value | p-value | $f^2$ | Decision |
|------------|------|-------|------------|---------|---------|-------|----------|
| H1         | Stakeholder interest → Stakeholder Management | 0.448 | 0.116 | 3.872** | <0.01  | 0.433 | supported |
| H2         | Stakeholder influence → Stakeholder Management | 0.491 | 0.108 | 4.550** | <0.01  | 0.522 | supported |
| H3         | Stakeholder Management → Sustainable ecotourism | 0.518 | 0.141 | 3.669** | <0.01  | 0.207 | supported |
| H5         | Stakeholder influence → Sustainable ecotourism | -0.012 | 0.139 | 0.087  | >0.05  | 0.000 | Not supported |
| H6         | Stakeholder interest → Sustainable ecotourism | 0.262 | 0.089 | 3.181** | <0.01  | 0.089 | supported |

Note: ** Results are significant at *p < 0.05, **p< 0.01
concluded that the effect of mediation was statistically significant. The outcome of the mediation was shown below.

Moreover, the researchers also calculated the indirect effect, specific indirect effect and total effect. The total indirect results showing that beta values for both hypotheses are $H4a = 0.255$ and $H4b = 0.232$ are significant with t values $t = 2.791$ and $t = 2.598$ having p values less than 0.05.

## 5 fsQCA causal recipe

This study’s results were augmented by the use of fsQCA, which enables researchers to discover causal recipes. Table 7 shows the results of this test. The results of fsQCA indicate that there was only one causal recipe that could help implement sustainable ecotourism in the destination (coverage: 0.811729, consistency: 0.967957). The model indicates that all three conditions need to be present and carefully understood to implement ecotourism sustainability in Penang Hill.

fsQCA identified that to manage stakeholders, it is vital to understand their interests and influence. Table 8 shows the results of the analysis of the necessary conditions to implement sustainable ecotourism. Proper management of stakeholders according to their interests is vital for achieving ecotourism sustainable as the magnitude of consistency values was above 0.90 and more than the values of SI and SF separately. Olya and Han (2020) reported that consistency values above 0.85 are considered as an acceptable cutoff of necessary condition.
6 Discussion and conclusion

The study findings correlated with the results of previous studies where stakeholders’ interests and influence power were significantly related to sustainable ecotourism (Momir et al., 2014; Van Cuong et al., 2018; Das & Chatterjee, 2015; Lee, Kim, and Kwon, 2017). The projected model of path relationships’ validity and reliability were within the threshold values. The results identified a positive and statistically significant effect of stakeholder management as a mediator, which can help achieve sustainable ecotourism in Penang Hill. This is also in-line with the studies such as Su et al. (2014) and Agüera (2013), who indicated that the management of key stakeholders is vital for ecotourism sustainability in the destination.

Moreover, this study identified and described a causal relationship between the four variables, stakeholders’ interest, stakeholder influence, stakeholder management, and sustainable ecotourism. The research framework identified in the study indicated that if stakeholders are properly managed accordingly to their interests and level of influence, the ecotourism sustainability process will be smoother, and long-term sustainability can be achieved. Past studies such as Kenawy et al. (2017), Moswete et al. (2012), Su et al. (2014), and Yi-fong (2012) have also identified understanding stakeholder interests and influence as the key to achieving sustainable ecotourism. However, in the past, studies did not consider multi-stakeholders’ interests and influence together for their management to achieve sustainable ecotourism in the destination. The study noted that understanding stakeholders’ interests or stakeholders’ level of influence alone could not guide toward achieving sustainable ecotourism. When stakeholder management is done by understanding these two factors combined, significantly positive results could be achieved. Moreover, this is also observed with the studies conducted in ecotourism context by Waligo et al. (2013), Zehrer and Hallmann (2015), Candrea and Herțanu (2015) where they noted that understanding factors like stakeholders level of influence and their interests can lead toward developing management strategies that will align stakeholders toward implementing sustainable ecotourism in the destination. This study demonstrated stakeholders’ crucial role and the importance of managing primary stakeholders in achieving sustainable ecotourism. Understanding interests and influence attributes will give a solid foundation for stakeholder management.

One primary goal of this research was to evaluate stakeholder management’s mediating role in implementing sustainable ecotourism and compare the direct and indirect effects for the framework’s development. The results revealed the direct and indirect effect of stakeholders interests (SI) on sustainable ecotourism (SE). Therefore, stakeholders interest is shown to have a significant impact on achieving sustainable ecotourism through stakeholder management indirectly, indicating a complementary medication effect. Moreover, the results also confirmed that stakeholders influence (SF) effect was significant indirectly and not directly,

| Table 8 Necessary conditions analysis results |
|---------------------------------------------|
| Antecedent necessary Condition     | Outcome: Stakeholder Management | Outcome: Sustainable Ecotourism |
| Consistency | Coverage | Consistency | Coverage |
| SI         | 0.915441 | 0.950877 | 0.913469 | 0.938205 |
| SF         | 0.886531 | 0.955856 | 0.866824 | 0.924144 |
| SM         | 0.941186 | 0.941186 | 0.930649 |
indicating a full mediation and identifying that managing SF will help achieve ecotourism sustainability which was also observed to be similar with studies conducted by Nitzl et al. (2016) and Zhao et al. (2010). Based on the literature review, it is vital to consider stakeholder interests and stakeholder influence to achieve sustainable ecotourism in the destination (Lee et al., 2017; Moswete et al., 2012; Timur & Getz, 2008). The results identified a positive and significant effect of stakeholder management as a mediator, which can help implement sustainable ecotourism in Penang Hill. This is also in-line with the studies such as Su et al. (2014) and Agüera (2013), where the researchers indicated that the management of primary stakeholders is vital for ecotourism sustainability in the destination. These results show that stakeholder management as a mediator plays a crucial role in achieving sustainable ecotourism.

Lastly, the study noted that understanding stakeholders’ interest or stakeholders’ level of influence alone could not guide toward the achievement of sustainable ecotourism. This was also pointed out during the fsQCA necessary condition analysis that all these factors have to be understood to manage stakeholders appropriately. The fsQCA results predicted how combining these three dimensions could help achieve ecotourism sustainability. Specifically, combining these three dimensions will form a recipe that leads to ecotourism sustainability in the destination. When stakeholder management is done by understanding these factors combined, significantly positive results could be achieved. This is also in-line with the studies conducted by Waligo et al. (2013), Zehrer and Hallmann (2015), Candrea and Herțanu (2015), where they noted that understanding factors like stakeholders level of influence and their interests can lead to developing management strategies that will align stakeholders toward achieving ecotourism sustainability in the destination. This study demonstrated stakeholders’ crucial role and the importance of managing key stakeholders in implementing sustainable ecotourism.

Penang Hill Corporation can also advise the stakeholders about the monetary and tangible benefits resulting from ecotourism activities and how they can benefit the community and the area. This will help develop trust among the stakeholders and collaborate to achieve the same goal that will benefit Penang Hill. Stakeholder engagement is necessary to motivate key stakeholders and pave the way for new stakeholders. It is vital for Penang Hill Corporation to keep on assessing the interests, capabilities (influence) and needs of stakeholders to make sure key stakeholders are supportive and work together to achieve ecotourism sustainability in Penang Hill. This is accordance with studies undertaken by Waligo et al. (2013) and Friedman and Miles (2006) where they indicate that key stakeholders interests need to be carefully and continuously assessed to make sure stakeholders remain cooperative toward the goal. Moreover, PHC needs to take care of the issues generated during the Covid-19 and can also be foreseen after the Covid-19 pandemic. Small stakeholders such as small businesses need to be supported financially and encouraged regarding their betterment. This is also consistent with the study conducted by Salman et al. (2020), where they highlighted that small businesses present in the tourism destination are impacted significantly. Therefore, appropriate efforts and support is required during and after the Covid-19 pandemic for all stakeholders of the destination (Salman et al., 2021; Salman Jaafar, & Mohamad, 2021a; Salman, Kamerkar, et al., 2021).

7 Theoretical and practical contributions

Previous studies focused on the issues related to ecotourism development without considering the perspectives of multiple stakeholders. This study is among the very few related to the context of multi-stakeholder management to achieve successful ecotourism and to have combined symmetric and asymmetric techniques to unveil how ecotourism can be
sustained for a long term. Secondly, the most significant contribution of this study is the identification of a multi-stakeholder management framework that can help achieve sustainable ecotourism in the destination. The literature on ecotourism disclosed many issues in the implementation and achieving sustainability of ecotourism globally. Several studies have explored different factors related to implementing sustainable ecotourism in Penang Hill; however, there is a lack of frameworks that combine multiple stakeholder interests and influence factors to develop management techniques for implementing sustainable ecotourism in the destination. The results of this study verified that the developed model for the management of multi-stakeholders acts as a predictor for achieving sustainable ecotourism, which can also be regarded as a significant contribution toward the body of knowledge of sustainable ecotourism literature.

From a practical standpoint, the research findings are valuable for enhancing stakeholder management techniques for destinations such as Penang Hill. Many previous studies in Malaysia have explored stakeholders’ importance to achieve ecotourism sustainability, but they were unable to explore such diverse factors of stakeholders’ interests and influence which were explored in this study. Becoming a biosphere reserve and maintaining the status of a biosphere reserve is difficult for destinations. Therefore, this study guides to achieve this by understanding stakeholders. Additionally, this study guided to identify that stakeholders’ interests played a significant role toward achieving ecotourism sustainability in the destination. Therefore, the management authority and the policymakers should focus on stakeholders’ interests, especially the economic interests of the stakeholders in their management plans. This will not only guide toward stakeholder’s better management but also will help to achieve sustainable ecotourism in the biosphere reserves worldwide.

Furthermore, from the Penang Hill perspective, this was the first ever study conducted on Penang Hill to manage multiple stakeholders to achieve ecotourism sustainability in the destination. The study results show the significance of stakeholder management in a tourism destination and contribute to identifying a guideline for managing multiple stakeholders. The study results can be used in other ecotourism sites not only in Malaysia but globally in the destinations that share similar settings. This practical contribution can help the government and local authorities achieve sustainable ecotourism model.

8 Limitations and implications

This study is novel in investigating the mediating role of stakeholder management between stakeholders’ interests and influences toward achieving ecotourism sustainability. However, as with any research, limitations exist. The research can be enhanced by exploring further information by involving more stakeholders because different members can have different viewpoints. It is vital to explore different perspectives to understand stakeholders. Secondly, the research was conducted on Penang Hill, and the results were based on primary stakeholders involved in Penang Hill only. The results cannot be generalized to other contexts until tested outside Penang Hill; therefore, testing the framework in other settings is recommended. Moreover, this study has implications in pursuing sustainable ecotourism development, policies related to destination planning, and stakeholder management. Sustainable tourism lacks leadership and management in many cases (Fig. 1).

Second, the study offers solutions that can enhance and promote ecotourism sustainability in Penang Hill and may be adopted by other ecotourism sites with similar attributes. First, a profit-driven approach by some stakeholders in ecotourism should be discouraged
via workshops and seminars. Though Covid-19 has impacted tourism adversely, this is still germane to achieving sustainable ecotourism across the globe, especially in developing countries such as Malaysia. This should be identified and tactically addressed by the management authority, which this study has achieved. An informal approach can be adapted to address issues of this nature and can be very productive in the long run to achieve sustainable ecotourism. Also, policies and programs that will promote stakeholder engagement by PHC management should be encouraged. Engagement that will recognize history and ownership should be the way to go. Furthermore, institutions such as PHC should ensure that the host communities build trust in them. This can be achieved via engagement that gives them a sense of belonging.

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References
Abdul-Aziz, A.-R., & Kassim, P. S. (2011). Objectives, success and failure factors of housing public-private partnerships in Malaysia. Habitat International, 35(1), 150–157.
Abdullah, A. R., Weng, C. N., Afif, I., & Fatah, A. (2018). Ecotourism in Penang national park: A multi-stakeholder perspective on environmental issues. Journal of Business and Social Development, 6(1), 70–83.
Adongo, R., & Kim, S. (2018). Whose festival is it anyway? Analysis of festival stakeholder power, legitimacy, urgency, and the sustainability of local festivals. *Journal of Sustainable Tourism, 26*(11), 1863–1889. https://doi.org/10.1080/09669582.2018.1514042

Agüera, F. (2013). Teoría Stakeholder como modelo para el desarrollo sostenible en ecoturismo. *Revista de Investigación En Turismo y Desarrollo Local, 6*(4), 17. http://turydes.eumed.net/15/stakeholders.pdf

Ali, F., Rasoolimanesh, S. M., Sarstedt, M., Ringle, C. M., & Ryu, K. (2018). An assessment of the use of partial least squares structural equation modeling (PLS-SEM) in hospitality research. *International Journal of Contemporary Hospitality Management, 30*(1), 514–538. https://doi.org/10.1108/IJCHM-10-2016-0568

Ayachi, H., & Jaouadi, S. (2017). Problems and perspective of ecotourism in the Island of Farasan. *Society and Business Review, 12*(2), 235–251. https://doi.org/10.1108/sbr-10-2016-0056

Ayala-Orozco, B., Rosell, J. A., Merçon, J., Bueno, I., Alatorre-Frenik, G., Langle-Flores, A., & Lobato, A. (2018). Challenges and strategies in place-based multi-stakeholder collaboration for sustainability: Learning from experiences in the Global South. *Sustainability (Switzerland).* https://doi.org/10.3390/su10093217

Aziz, A., Barzekar, G., Ajuhari, Z., & Idris, N. H. (2015). Criteria & indicators for monitoring ecotourism sustainability in a protected watershed: A Delphi consensus. *IOSR Journal of Environmental Science, 9*(3), 1–09. https://doi.org/10.9790/2402-09310109

Backman, K. F., & Munanura, I. (2015). Introduction to the special issues on ecotourism in Africa over the past 30 years. *Journal of Ecotourism, 14*(2–3), 95–98. https://doi.org/10.1080/14724049.2015.1128058

Bashir, M., Jianqiao, L., Ghazanfar, F., & Abrar, M. (2012). The effect of perception of existence of HPWS on employee’s organizational commitment: A test of social exchange relationship and contingency perspective to implement HPWS in universities of China and Pakistan. In *Advances in Asian Social Science (Vol. 1, Issue 1).* www.worldscicencepublisher.org

Berardi, U. (2013). Stakeholders’ influence on the adoption of energy-saving technologies in Italian homes. *Energy Policy, 60*, 520–530. https://doi.org/10.1016/j.enpol.2013.04.074

Bouamrane, M. (2006). *Biodiversity and stakeholders: concertation itineraries.*

Butler, R. (2018). Sustainable tourism in sensitive environments: AWolf in sheep’s clothing? *Sustainability (Switzerland).* https://doi.org/10.3390/su10061789

Byrd, E. T. (2007). Stakeholders in sustainable tourism development and their roles: Applying stakeholder theory to sustainable tourism development. *Tourism Review, 62*(2), 6–13. https://doi.org/10.1108/1660570778000309

Byrd, E. T., & Gustke, L. (2011). Using decision trees to identify tourism stakeholders. *Journal of Place Management and Development, 4*(2), 148–168. https://doi.org/10.1108/175383311111153160

Candrea, A. N., & Hertanu, A. (2015). Developing ecotourism destinations in Romania. A case study approach. *Bulletin of the Transilvania University of Brasov, Economic Sciences, Series V, 8*(2), 163.

Céspedes-Lorente, J., de Burgos-Jiménez, J., & Álvarez-Gil, M. (2003). Stakeholders’ environmental influence An empirical analysis in the Spanish hotel industry. *Scandinavian Journal of Management, 19*(3), 333–358. https://doi.org/10.1016/S0956-5221(02)00034-9

Chan, R., & Bhutta, K. (2013). Ecotourism planning and sustainable community development: theoretical perspectives for Nepal. *South Asian Journal of Tourism and Heritage, 5*(1), 69–96.

Chen, Y. S., & Liu, L. W. (2017). Interaction and integration of cultural inheritance, ecotourism, and industrial development: Strategies, mechanisms and spatial practice of the amis dietary culture transformed into creativity living industry. *International Review for Spatial Planning and Sustainable Development, 5*(3), 66–78.

Cheung, L. T. O., & Jim, C. Y. (2013). Ecotourism service preference and management in Hong Kong. *International Journal of Sustainable Development and World Ecology, 20*(2), 182–194. https://doi.org/10.1080/13504509.2013.775192

Cobbina, P. B., Amenuvor, D., Black, R., & Peprah, C. (2017). Ecotourism in the Kakum conservation area, Ghana: Local politics, practice and outcome. *Journal of Outdoor Recreation and Tourism, 20*, 34–44. https://doi.org/10.1016/j.jort.2017.09.003

Cobbina, P. B., Black, R., & Thwaites, R. (2015). Ecotourism implementation in the Kakum Conservation Area, Ghana: Administrative framework and local community experiences. *Journal of Ecotourism, 14*(2–3), 223–242. https://doi.org/10.1080/14724049.2015.1051536

Cohen, E., & Cohen, S. A. (2012). Current sociological theories and issues in tourism. *Annals of Tourism Research, 39*(4), 2177–2202. https://doi.org/10.1016/j.annals.2012.07.009

Connolly, C. (2019). Urban political ecologies of heritage: Integrating cultural and natural landscapes in Penang, Malaysia. *Transactions of the Institute of British Geographers, 45*(1), 168–180. https://doi.org/10.1111/tran.12335
Coria, J., & Calfucura, E. (2012). Ecotourism and the development of indigenous communities: The good, the bad, and the ugly. Ecological Economics, 73, 47–55. https://doi.org/10.1016/j.ecolecon.2011.10.024

Dabphet, S., Scott, N., & Ruhanen, L. (2012). Applying diffusion theory to destination stakeholder understanding of sustainable tourism development: A case from Thailand. Journal of Sustainable Tourism, 20(8), 1107–1124. https://doi.org/10.1080/09699588.2012.673618

Dam, S. (2013). Issues of sustainable ecotourism development in sikkim: an analysis. South Asian Journal of Tourism and Heritage, 6(2), 32–48.

Das, M., & Chatterjee, B. (2015). Ecotourism: A panacea or a predicament? Tourism Management Perspectives, 14, 3–16. https://doi.org/10.1016/j.tmp.2015.01.002

Dunham, L., Freeman, R. E., & Liedtka, J. (2006). Enhancing stakeholder practice: A particularized exploration of community. Business Ethics Quarterly, 16(1), 23–42. https://doi.org/10.5840/beq20061611

Ebekozien, A. (2019). Root cause analysis of demand-supply gap to low-cost housing in Malaysia [USM]. Edo Herlangga, R., & Basuni, S. (2019). Stakeholder management of Kawasan konservasi mangrove dan bekantan in Tarakan city. Jurnal Manajemen Hutan Tropika, 23(5), 146–153. https://doi.org/10.7226/jtfm25.3.146

ElWakeel, O., & Andersen, B. (2019). Stakeholder evolution: A study of stakeholder dynamics in 12 Norwegian projects. International Journal of Managing Projects in Business.

ElWakeel, O., & Andersen, B. (2020). Stakeholder evolution: A study of stakeholder dynamics in 12 Norwegian projects. International Journal of Managing Projects in Business, 13(1), 172–196. https://doi.org/10.1108/IMPPB-10-2018-0218

Eskerod, P., & Huemann, M. (2013). Sustainable development and project stakeholder management: What standards say. International Journal of Managing Projects in Business, 6(1), 36–50. https://doi.org/10.1108/1753837131291017

Fennell, D. A. (2003). Ecotourism: An Introduction. Francisco de Oliveira, G., & Rabechini, R. (2019). Stakeholder management influence on trust in a project: A quantitative study. International Journal of Project Management, 37(1), 131–144. https://doi.org/10.1016/j.ijproman.2018.11.001

Freeman, R. E. (2010). Strategic management: A stakeholder approach. Cambridge university press.

Freeman, R. E. (2015). Strategic management: A stakeholder approach. In Strategic Management: A Stakeholder Approach. https://doi.org/10.1017/CBO9781139192675

Freeman, R. E. (1999). Divergent stakeholder theory. Academy of Management Review, 24(2), 233–236. https://doi.org/10.5465/AMR.1999.1893932

Friedman, A., & Miles, S. (2006). Stakeholders: Theory and practice. UK: Oxford University Press on Demand.

Gannon, M. J., Baxter, I. W. F., Collinson, E., Curran, R., Farrington, T., Glasgow, S., Godsm, E. M., Gori, K., Jack, G. R. A., Lochrie, S., Maxwell-Stuart, R., MacLaren, A. C., McIntosh, R., O’Gorman, K., Ottaway, L., Perez-Vega, R., Taheri, B., Thompson, J., & Yalinay, O. (2017). Travelling for Umrah: Destination attributes, destination image, and post-travel intentions. Service Industries Journal, 37(7–8), 448–465. https://doi.org/10.1080/02642069.2017.1333601

Getz, D. (2005). Stakeholder involvement in sustainable tourism: balancing the voices. In Global Tourism (pp. 230–247). Elsevier Inc. https://doi.org/10.1016/b978-0-7506-7789-9.50019-4

Hair Jr, J. F., Sarstedt, M., Ringle, C. M., & Gudergan, S. P. (2017). Advanced issues in partial least squares structural equation modeling. SaGé publications.

Harilal, V., & Tichawa, T. M. (2018). Ecotourism and Alternative Livelihood Strategies in Cameroon’s Protected Areas. EuroEconomica, 37(2).

Harrison, J. S., Freeman, R. E., & de Abreu, M. C. S. (2015). Stakeholder theory as an ethical approach to effective management: Applying the theory to multiple contexts. Revista Brasileira De Gestao De Negocios, 17(55), 858–869. https://doi.org/10.7819/rgbn.v17i55.2647

Hatipoglu, B., Alvarez, M. D., & Ertuna, B. (2016). Barriers to stakeholder involvement in the planning of sustainable tourism: The case of the Thrace region in Turkey. Journal of Cleaner Production, 111, 306–317. https://doi.org/10.1016/j.jclepro.2014.11.059

Hawkins, D., Lamoureux, K., & Poon, A. (2002). Relationship of Tourism Development to Biodiversity Conservation and the Sustainable Use of Energy and Water Resources, report to the UNEP.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. Journal of the Academy of Marketing Science, 43(1), 115–135. https://doi.org/10.1007/s11747-014-0403-8

Hollebeek, L. D., Sprott, D. E., Urbanovicius, S., Sigurdsson, V., Clark, M. K., Riisalu, R., & Smith, D. L. G. (2022). Beyond the Big Five: The effect of machiavellian, narcissistic, and psychopathic
personality traits on stakeholder engagement. Psychology and Marketing. https://doi.org/10.1002/mar.21647

Jaafar, M., Ebekozien, A., Mohamad, D., & Salman, A. (2021b). A systematic review of Asian community participation in biosphere reserves. PSU Research Review, ahead-of-print(ahead-of-print). https://doi.org/10.1108/PRR-12-2020-0040

Jaafar, M., Ebekozien, A., & Mohamad, D. (2021a). Community participation in environmental sustainability: A case study of proposed Penang hill biosphere reserve Malaysia. Journal of Facilities Management, 19(4), 527–549. https://doi.org/10.1108/JFM-03-2021-0033

Jayasuriya, S., Zhang, G., & Yang, R. J. (2020). Exploring the impact of stakeholder management strategies on managing issues in PPP projects. International Journal of Construction Management, 20(6), 666–678.

Jaafar, M., Ebekozien, A., Mohamad, D., & Salman, A. (2021b). A systematic review of Asian community participation in biosphere reserves. PSU Research Review, ahead-of-print(ahead-of-print). https://doi.org/10.1002/mar.21647

Jaafar, M., Ebekozien, A., & Mohamad, D. (2021a). Community participation in environmental sustainability: A case study of proposed Penang hill biosphere reserve Malaysia. Journal of Facilities Management, 19(4), 527–549. https://doi.org/10.1108/JFM-03-2021-0033

Jayasuriya, S., Zhang, G., & Yang, R. J. (2020). Exploring the impact of stakeholder management strategies on managing issues in PPP projects. International Journal of Construction Management, 20(6), 666–678.

JrMatthewsMatthewsSarstedt, J. F. H. L. M. R. L. M. (2017). PLS-SEM or CB-SEM: Updated guidelines on which method to use. International Journal of Multivariate Data Analysis, 1(2), 107. https://doi.org/10.1504/ijmda.2017.087624

K.C., A. (2016). Ecotourism and Its Role in Sustainable Development of Nepal. In Tourism - From Empirical Research Towards Practical Application. InTech.

Kenawy, E., Osman, T., & Alshamndy, A. (2017). What are the main challenges impeding implementation of the spatial plans in Egypt using ecotourism development as an example? Social Sciences, 6(3), 75. https://doi.org/10.3390/socsci6030075

Kenawy, E. H., & Shaw, D. (2014). Developing a more effective regional planning framework in Egypt: The case of ecotourism. WIT Transactions on Ecology and the Environment, 187, 1–11. https://doi.org/10.2495/ST140071

Kent, K., John Sinclair, A., & Diduck, A. (2012). Stakeholder engagement in sustainable adventure tourism development in the Nanda Devi biosphere reserve, India. International Journal of Sustainable Development and World Ecology, 19(1), 89–100. https://doi.org/10.1080/13504509.2011.595544

Komppula, R. (2016). The role of different stakeholders in destination development. Tourism Review, 71(1), 67–76. https://doi.org/10.1108/TR-06-2015-0030

Krce Miocic, B., Razović, M., & Klarin, T. (2016). Management of sustainable tourism destination through stakeholder cooperation. Management - Journal of Contemporary Management Issues, 2(2), 99–120.

Lalicic, L. (2018). Open innovation platforms in tourism: How do stakeholders engage and reach consensus? International Journal of Contemporary Hospitality Management, 30(6), 2517–2536. https://doi.org/10.1108/IJCHM-04-2016-0233

Lecuyer, L., White, R. M., Schmook, B., & Calmé, S. (2018). Building on common ground to address biodiversity conflicts and foster collaboration in environmental management. Journal of Environmental Management, 220(May), 217–226.

Lee, J. H., Kim, S. H., & Kwon, H. S. (2017). Mapping interests by stakeholders’ subjectivities toward ecotourism resources: The case of Seocheon-Gun. Korea. Sustainability (Switzerland). https://doi.org/10.3390/su9010093

Lee, K. F. (2001). Sustainable tourism destinations: The importance of cleaner production. Journal of Cleaner Production, 9(4), 313–323. https://doi.org/10.1016/S0959-6526(00)00071-8

Liou, G.-B. (2013). Ecotourism cultural impact analysis. In ProQuest Dissertations and Theses.

Litheko, A., & Potgieter, M. (2019). Strategic management of tourism stakeholders: Bakgatla-ba-Kgafela, South Africa. African Journal of Hospitality, Tourism and Leisure, 8(2). http://www.ajhlt.com

Lowman, M., Ruppert, N., & Mohd Nor, S. A. (2019). Further advancing the expert bioblitz for the rainforest conservation toolkit. Conservation Science and Practice, 1(1), e2. https://doi.org/10.1111/csp2.2

Lyon, A., Hunter-Jones, P., & Warnaby, G. (2017). Are we any closer to sustainable development? Listening to active stakeholder discourses of tourism development in the Waterberg Biosphere Reserve, South Africa. Tourism Management, 61, 234–247.

Manowong, E., & Ogunlanas, S. (2010). Strategies and Tactics for Managing Construction Stakeholders. In Construction Stakeholder Management (pp. 121–137). Wiley-Blackwell. https://doi.org/10.1002/9781444415349.ch8

McComb, E. J., Boyd, S., & Boluk, K. (2017). Stakeholder collaboration: A means to the success of rural tourism destinations? A critical evaluation of the existence of stakeholder collaboration within the Mournes Northern Ireland. Tourism and Hospitality Research, 17(3), 286–297. https://doi.org/10.1177/1467358415583738

Mihalic, T. (2016). Sustainable-responsible tourism discourse - Towards “responsustable” tourism. Journal of Cleaner Production, 111, 461–470.
Momir, B., Petroman, I., & Merghea, P. (2014). Ecotourism as a major factor in the preservation of flora and fauna biodiversity in banat. Lucrări Științifice Management, 16(4), 98–104.

Morgera, E., & Razzaque, J. (2017). Biodiversity and nature protection law. In Biodiversity and Nature Protection Law. https://doi.org/10.4337/9781783474257

Moswete, N. N., Thapa, B., & Child, B. (2012). Attitudes and opinions of local and national public sector stakeholders towards Kgalagadi Transfrontier Park, Botswana. International Journal of Sustainable Development and World Ecology, 19(1), 67–80.

Newcombe, R. (2003). From client to project stakeholders: A stakeholder mapping approach. Construction Management and Economics, 21(8), 841–848.

Nicolaides, A. (2015). Tourism Stakeholder Theory in practice: instrumental business grounds, fundamental normative demands or a descriptive application? African Journal of Hospitality, Tourism and Leisure, 4(2), 1–27.

Nigar, N. (2018). Ecotourism for Sustainable Development in Gilgit-Baltistan: Prospects under CPEC. In Strategic Studies (Vol. 38, Issue 3).

Nitzl, C., Roldan, J. L., & Cepeda, G. (2016). Mediation analysis in partial least squares path modelling, Helping researchers discuss more sophisticated models. Industrial Management and Data Systems, 116(9), 1849–1864. https://doi.org/10.1108/IMDS-07-2015-0302

Noto, G., & Noto, L. (2019). Local strategic planning and stakeholder analysis: suggesting a dynamic performance management approach. Public Organization Review, 19(3), 293–310. https://doi.org/10.1007/s11115-018-0403-0

Ntloko, N. J. (2016). The impact of an outdoor and wine festival on established businesses in the Breede Valley region, Western Cape, South Africa. African Journal of Hospitality, 5(3). http://digitalknowledge.cput.ac.za/handle/11189/7548

Phillips, R. (2004). Stakeholder theory and organizational ethics. In Choice Reviews Online (Vol. 41, Issue 08). Berrett-Koehler. https://doi.org/10.5860/choice.41-4764

Phillips, R. A. (1997). Stakeholder theory and a principle of fairness. Business Ethics Quarterly, 7(1), 51–66. https://doi.org/10.2307/3857232

Phillips, A. (2003). Turning ideas on their head. The George Wright Forum, 20(2), 8.

Picard, D. (2015). Making ecotourism sustainable: refocusing on economic viability. Lessons learnt from the “Regional strategic action plan for coastal ecotourism development in the South Western Indian Ocean.” Journal of Sustainable Tourism, 23(6), 819–837.

Riahi, Y. (2017). Project stakeholders: Analysis and management processes. International Journal of Economics and Management Studies, 4(3), 39–45.

Ringle, C. M., Wende, S., & Becker, J. M. (2015). SmartPLS 3. SmartPLS GmbH. Journal of Service Science and Management, 10(3), 32–49.

Rivera, J. F. R., & Gutierrez, E. L. M. (2019). A framework toward sustainable ecotourism value chain in the Philippines. Journal of Quality Assurance in Hospitality and Tourism, 20(2), 123–142. https://doi.org/10.1080/1528008X.2018.1492495
Rowley, T. J., & Moldoveanu, M. (2003). When will stakeholder groups act? An interest- and identity-based model of stakeholder group mobilization. In *Academy of Management Review* (Vol. 28, Issue 2, pp. 204–219). Academy of Management.

Ruiz-Mallén, I., Corbera, E., Calvo-Boyero, D., Reyes-García, V., & Brown, K. (2015). How do biosphere reserves influence local vulnerability and adaptation? Evidence from Latin America. *Global Environmental Change*, 33, 97–108.

Ryan, C. (2002). Equity, management, power sharing and sustainability—issues of the ‘new tourism’. *Tourism Management*, 23(1), 17–26.

Saidmamatov, O., Matyakubov, U., Rudenko, I., Filimonau, V., Day, J., & Luthe, T. (2020). Employing ecotourism opportunities for sustainability in the Aral sea region: Prospects and challenges. *Sustainability (Switzerland)*, 12(21), 1–20.

Salman, A., Jaafar, M., & Mohamad, D. (2020). Sustainability: A thematic synthesis of globally published ecotourism frameworks. *African Journal of Hospitality, Tourism and Leisure*, 9(3), 246–258.

Salman, A., Jaafar, M., & Mohamad, D. (2021). Understanding the importance of stakeholder management in achieving sustainable ecotourism. *Pertanika Journal of Social Sciences and Humanities*, 29(1), 731–753.

Salman, A., Jaafar, M., Mohamad, D., & Malik, S. (2021b). Ecotourism development in Penang Hill: A multi-stakeholder perspective towards achieving environmental sustainability. *Environmental Science and Pollution Research*, 28(31), 42945–42958.

Salman, A., Kamerkar, U., Jaafar, M., & Mohamad, D. (2021c). Empirical analysis of COVID-19 induced socio cognitive factors and its impact on residents of Penang Island. *International Journal of Tourism Cities*. https://doi.org/10.1108/IJTC-05-2020-0091

Sheehan, L. R., & Ritchie, J. R. B. (2005). Destination stakeholders: Exploring identity and salience. *Annals of Tourism Research*, 32(3), 711–734.

Simpson, M. C. (2008). Community Benefit Tourism Initiatives-A conceptual oxymoron? *Tourism Management*, 29(1), 1–18. https://doi.org/10.1016/j.jtouman.2007.06.005

Stoll-Kleemann, S., De La Vega-Leinert, A. C., & Schultz, L. (2010). The role of community participation in the effectiveness of UNESCO Biosphere Reserve management: Evidence and reflections from two parallel global surveys. *Environmental Conservation*, 37(3), 227–238. https://doi.org/10.1017/S037689291000038X

Su, M. M., Wall, G., & Ma, Z. (2014). Assessing ecotourism from a multi-stakeholder perspective: Xingkai Lake national nature reserve China. *Environmental Management*, 54(5), 1190–1207. https://doi.org/10.1007/s00267-014-0360-5

Sucheran, R., & Arulappan, L. (2020). Eco-Labels in the Tourism Sector in South Africa: Benefits and Barriers. *African Journal of Hospitality, Tourism and Leisure*, 9(6), 979–996.

Tantalo, C., & Priem, R. L. (2016). Value creation through stakeholder synergy. *Strategic Management Journal*, 37(2), 314–329. https://doi.org/10.1002/smj.2337

The International Ecotourism Society. (2016). What is Ecotourism? | The International Ecotourism Society

Timur, S., & Getz, D. (2008). A network perspective on managing stakeholders for sustainable urban tourism. *International Journal of Contemporary Hospitality Management*, 20(4), 445–461. https://doi.org/10.1108/09596110810873543

Tsaur, S. H., Lin, Y. C., & Lin, J. H. (2006). Evaluating ecotourism sustainability from the integrated perspective of resource, community and tourism. *Tourism Management*, 27(4), 640–653. https://doi.org/10.1016/j.tourman.2005.02.006

Tseng, M. L., Lin, C., Remen Lin, C. W., Wu, K. J., & Sriphon, T. (2019). Ecotourism development in Thailand: Community participation leads to the value of attractions using linguistic preferences. *Journal of Cleaner Production*, 231, 1319–1329. https://doi.org/10.1016/j.jclepro.2019.05.305

Ubaidillah, N. Z., Ab-Rahim, R., Jul, S., Edman, A. B. N. A. S., & Hamdan, R. (2018). Analysing the Local Communities’ perception on the economic and environmental factors of ecotourism in tagung system framework: The Case of Semedang Village, Sarawak, Malaysia. *International Journal of Academic Research in Business and Social Sciences*, https://doi.org/10.6007/ijarbs/v8-i11/4984

Üllenberg, A., Buchberger, C., Meindl, K., Rupp, L., Springsguth, M., & Straube, B. (2015). Evaluating Cross-Border Natural Resource Management Projects. Community-Based Tourism Development and Fire Management in Conservation Areas of the SADC Region.

Umutooni, C. (2014). STAKEHOLDER PARTICIPATION AND PROJECT SUCCESS AMONG NGOs A Case study of WORLD VISION in Gasabo District, Rwanda.

Van Cuong, C., Dart, P., Dudley, N., & Hockings, M. (2018). building stakeholder awareness and engagement strategy to enhance biosphere reserve performance and sustainability: The case of Kien Giang Vietnam. *Environmental Management*, 62(5), 877–891. https://doi.org/10.1007/s00267-018-1094-6
Van Cuong, C., Dart, P., & Hockings, M. (2017). Biosphere reserves: Attributes for success. *Journal of Environmental Management, 188*, 9–17. https://doi.org/10.1016/j.jenvman.2016.11.069

Voorhees, C. M., Brady, M. K., Calantone, R., & Ramirez, E. (2016). Discriminant validity testing in marketing: An analysis, causes for concern, and proposed remedies. *Journal of the Academy of Marketing Science, 44*(1), 119–134. https://doi.org/10.1007/s11747-015-0455-4

Voss, H. (2014). Environmental public participation in the UK. *International Journal of Social Quality, 4*(1), 26–40. https://doi.org/10.3167/ijsq.2014.040103

Waligo, V. M., Clarke, J., & Hawkins, R. (2013). Implementing sustainable tourism: A multi-stakeholder involvement management framework. *Tourism Management, 36*, 342–353. https://doi.org/10.1016/j.tourman.2012.10.008

Walker, D. H. T., Bourne, L. M., & Shelley, A. (2008). Influence, stakeholder mapping and visualization. *Construction Management and Economics, 26*(6), 645–658. https://doi.org/10.1080/01446190701882390

Walker, K., & Moscardo, G. (2014). Encouraging sustainability beyond the tourist experience: Ecotourism, interpretation and values. *Journal of Sustainable Tourism, 22*(8), 1175–1196. https://doi.org/10.1080/09669582.2014.918134

WBR. (2017). *World Bank Report on Stakeholder Analysis.*

Wei, M., & Yang, R. (2013). A research on eco-tourism development models based on the stakeholder theory. *Applied Mechanics and Materials, 291–294*, 1447–1450. https://doi.org/10.4028/www.scientific.net/AMM.291-294.1447

Wishitemi, B. E. L., Momanyi, S. O., Ombati, B. G., & Okello, M. M. (2015). The link between poverty, environment and ecotourism development in areas adjacent to Maasai Mara and Amboseli protected areas, Kenya. *Tourism Management Perspectives, 16*, 306–317. https://doi.org/10.1016/j.tmp.2015.07.003

Wondirad, A., Tolkach, D., & King, B. (2020). Stakeholder collaboration as a major factor for sustainable ecotourism development in developing countries. *Tourism Management.* https://doi.org/10.1016/j.tourman.2019.104024

Yang, R. J. (2014). An investigation of stakeholder analysis in urban development projects: Empirical or rationalistic perspectives. *International Journal of Project Management, 32*(5), 838–849. https://doi.org/10.1016/j.ijproman.2013.10.011

Yi-fong, C. (2012). The indigenous ecotourism and social development in Taroko National Park area and San-Chan tribe Taiwan. *Geojournal, 77*(6), 805–815.

Zailani, S., Govindan, K., Shaharudin, M. R., & Kuan, E. E. L. (2017). Barriers to product return management in automotive manufacturing firms in Malaysia. *Journal of Cleaner Production, 141*, 22–40. https://doi.org/10.1016/j.jclepro.2016.08.160

Zehrer, A., & Hallmann, K. (2015). A stakeholder perspective on policy indicators of destination competitiveness. *Journal of Destination Marketing and Management, 4*(2), 120–126. https://doi.org/10.1016/j.jdmm.2015.03.003

Zhao, X., Lynch, J. G., & Chen, Q. (2010). Reconsidering Baron and Kenny: Myths and truths about mediation analysis. *Journal of Consumer Research, 37*(2), 197–206.

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