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Impact of community participation on sustainable development of marine protected areas: Assessment of ecotourism development

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Abstract

This study aims to investigate the role of community participation and its impact on economic, environmental, and social sustainability in marine protected areas (MPAs) in Malaysia through the development of ecotourism. A structured questionnaire was employed for collecting data and analyzed using the partial least square method. The results indicate that community participation explains a significant amount of variance in ecotourism development. The findings reveal that ecotourism development contributes toward economic, social, and environmental sustainability directly and indirectly. This implies that ecotourism development and community participation are of paramount importance in achieving sustainable development in MPAs.

KEYWORDS

community participation, ecotourism development, marine protected areas, sustainable development

1 | INTRODUCTION

The growth of ecotourism and sustainable development has become a matter of serious concern. Ecotourism is growing rapidly in the tourism industry around the world. Choi et al. (2021) reported that ecotourism development is a distinct phenomenon of the international market and a crucial mode of the area of sustainable tourism. Accordingly, the principle of ecotourism and sustainable development is required to uphold environmental balance. In the last two decades of ecotourism growth, sustainable environmental development has become a matter of serious concern (Fletcher, 2019; Wondirad et al., 2020a). Ecotourism describes the natural resources-based tourism that preserves environmental sustainability and develops people's well-being. It can be well described with community participation, sustainability, environmental education, and nature

conservation for sustainable development of marine protected areas (MPAs).

In 2002, the United Nations declared "International year of ecotourism" and a vast number of tourism operators use "ecotourism" as a label of identity themselves in the niche tourism market (Beall et al., 2020). Ecotourism has become potential and it can encourage sustainable behavior, economical contributions to the communities, and support for environmental preservation. It is one of Malaysia's biggest tourism attractions. The productivity of MPAs in Malaysia makes ecotourism become one of the crucial industries speedily increasing in this country (Wong & Yong, 2020). Ecotourism is not only emphasizing the protection of natural area but also considered the local community, economy, and society.

Most of the countries in the world focus on environmentally friendly tourism through environmental preservation that may reduce

a negative impact on the environment. For the developing country, ecotourism is promoting the integration of economic growth for sustainable environmental development. Ecotourism is stimulated for developing nations due to a lack of modernization (Tseng et al., 2019), which may attract visitors from developed countries for environmentally friendly attractive commodities. Ecotourism is potential as it generates revenue, promotes cultures, lifestyles, job opportunities, and develops the standard of living for the community. Tourism and environmental negligence have had a worsening concern of ecological effects (Sriarkarin & Lee, 2018; Tseng et al., 2019) that lead to enlarge ecotourism and sustainable development through the local community involvement. This study aims to investigate the role of community participation that reflects ecotourism for the sustainable development of MPAs.

Ecotourism reflects the local community, culture, economy, and environment. It not only provides a solution for sustainable development of social, economic, and environment but also promotes natural and cultural diversity (Osman et al., 2018). Despite these, ecotourism fails to establish sustainable development due to a lack of community participation and its proper assessment (Lonn et al., 2018) of the MPAs. The potential tourism assessment and community involvement are important for the development of ecotourism and attracting tourists. Tseng et al. (2019) pointed out that potential tourism considers the value of resources within the community, service, accommodation, accessibility, infrastructure, and destinations that might be transformed into tourists' attractions. The destination should include basic elements such as accommodations, local communities, and accessibility for attracting tourists for their trips. Hsu (2019) postulates that usually ecotourism locations are situated in natural outlying areas where infrastructure and accommodations development are required to serve tourists, which in turn lead to the MPAs.

Ecotourism development can be observed by the combination of tourism potential. This study proposes using community participation to assess the development of ecotourism for the development of economic sustainability, social sustainability, and environmental sustainability. The community participating includes rural communities that lead to ecotourism development (Roca-Puig, 2019). The local communities should have the responsibility for natural resource management and environmental sustainability. Ecotourism development considers the activities that promote natural resource protection by residents, stakeholders, and tourists (Ocampo et al., 2018). Sustainable development consists of economic, social, and environmental sustainability. Economic sustainability is the ability of an economy to adopt practices that support long-term economic growth with a positive impact on the environmental, social dimensions of a community (Qiu et al., 2019). The environmental sustainability is a basic element of ecotourism development that contains climate, geography, and environmental standard. Geography is related to the places and the relationship between people and their environments. Geography determined flora and fauna, physical and behavioral traits of human societies (Masud et al., 2017). Although such determinism has its limitations but it bring out the widespread and longstanding conviction that location determines climate. Ocampo et al. (2018) study indicate

that the capability to develop ecotourism that supports environmental protection and sustainable development. Social sustainability involves the ability of a community to develop processes and structure that promotes wellbeing, designing service, housing, and government arrangements to help local communities.

Ecotourism does not have enough merits over rivals in the area of Malaysia because it is no easy task to build strengths (e.g., community participation, nature conservation, resources, and entrepreneurs). Ecotourism does not have enough merits compared to its rivals in the region of Malaysia, since it is exigent to develop strengths (for example, community participation, nature conservation, resources, and entrepreneurs). Ecotourism necessities to develop and promote its prospective in the country. Hence, the main objective of this study is to determine the effect of community participation on ecotourism development and to examine the interrelationships among ecotourism development, economic, environmental, and social sustainability. This study presents a conceptual model that presents a causal relationship for developing theoretical ideas and provides criteria for community practices of the potential development of ecotourism. The high potential of ecotourism can lead to the sustainable preservation of the environment and the well-being of the participation of local communities. The proposed model can be used by policymakers to understand the cause and effect relationships between community participation to promote ecotourism and sustainable development in Malaysia. The higher performance can lead to a competitive advantage of sustainable development in MPAs in Malaysia.

2 | LITERATURE REVIEW

2.1 | Underpinning theory

The alternative development theory (Pieterse, 1998) and Butler's sequence concept (Butler, 1980) were conceptualized for this study whether ecotourism development can lead to the sustainable development of MPAs. Ecotourism is an alternative development tool that considered the response of community awareness of environmental degradation. Pieterse (1998) believed that development efforts could be successful through community participation. The alternative development paradigm can contribute to the development of ecotourism and sustainable development through community participation. Murphy (1988) and Wall (1997) reported that the demand for sustainable development, community involvement, and community-level planning lead to ecotourism development and it can be considered an alternative development paradigm for sustainable development of the MPA. This study examines the community participations to investigate whether ecotourism development leads to people's livelihoods and sustainable development of MPAs in Malaysia. Butler's model is relevant to the generalization of the development spectrum of economic, social, and environmental implications (Fennell, 2008) of ecotourism and sustainable development of MPAs.

2.2 | Importance of MPAs

Community participation promotes ecotourists the capability to turn into a participant of marine natural preservation processes, making them cautious observers of changes, and minimizes any negative ecological effect. It also develops social, environmental, and economic sustainability. It can likewise be an approach to build a relationship with the marine environment and empower the involved parties to negotiate positively in public policy decisions, ensuring good outcomes for the communities. Community-based ecotourism is a crucial strategy for the MPAs of environmental education. Rhormens et al. (2017) explained that community-based ecotourism provides the ecotourist basic education on marine geo-biodiversity, permitting the comprehension of the significance of sea-life and marine in an energetic manner. MPAs have been created for the protestation of fisheries. To develop the resource of fisheries, coral reef areas must be protected. The territories of coral reef are a crucial environment as they present various stressors brought by human activities. Masud et al. (2017) stated that the marine parks of Malaysia were established to manage and protect marine environments, especially coral reefs and their greenery with a sustainable condition for people in future. The marine park of Malaysia has a new mission, vision, goals, and strategy for the implementation of marine parks. The department of marine park Malaysia has produced a joint effort with the local community by presenting an alternative source of revenue programs, cooperation with NGOs, and training of the community.

2.3 | Community participation

Community participation is a bottom-up approach whereby communities are involved to solve their problems. Tseng et al. (2019) study pointed out that community participation is introduced by different stakeholders as an effective method for ecotourism development, which in turn leads to the development of sustainable MPAs. This is because of its cultural resources, host communities, and socio-economic well-being. Sakata and Prideaux (2013) emphasized the importance of local community participation in ecotourism development. Sustainable development can succeed if the local community gives concentration to develop ecotourism and maintain business enterprises. The sustainability of long-run natural resources can be reflected by ecotourism development through community participation. Community involvement can reduce a negative impact on ecotourism development due to human practices. Osman et al. (2018) believed that the preservation of natural resources and culture, as well as the participation of local communities, are key to the success of ecotourism development.

The study explores an important relationship between community participation that affects ecotourism development with intended to support the communities for ecological use of natural resources within MPAs. The nature of ecotourism development is facing challenges in implementing community participation (Rodrigues & Prideaux, 2018). For example, tourism has a high level of initial

involvement from the residents of destination areas, but misunderstandings and uncertainties about the tourism industry are practically certain without sufficient resident involvement. The public representative in ecotourism planning is probably going to be challenging (Mirsanjari, 2012). This is particularly given the wide range of factors that may shape their perceptions and difficulty of findings generalizable patterns of resident response. These features of ecotourism development propose that community participation is required that is constant and instructive for all parties involved. Thus, we postulated that:

H1. Community participation has a significant relationship with ecotourism development.

2.4 | Ecotourism and sustainable development

Ecotourism ensures environmental, economic, social sustainability and improves the well-being of people (Choi et al., 2021). Mondino and Beery (2019) defined that ecotourism is a form of the travel industry that encourages learning experiences and evaluation of the natural environment. Ecotourism has become an essential platform in numerous development activities. Prasetyo et al. (2020) indicated that ecotourism could produce huge benefits to communities and contribute to natural preservation for the sustainable development of MPAs. Ecotourism is socioculturally and environmentally sustainable that increases the cultural resources base of the destination and promotes the feasibility of the activity. The sustainable development concept started in the 1960s regarding environmental degradation because of poor resource management. Since the environment has become an imperative global problem, sustainability can be adopted as a common strategy of sustainable economic, social, and environmental goals (Geijzendorffer et al., 2017; Machnik, 2021) which could contribute to the development of MPAs.

Khanra et al. (2021) indicated that ecotourism development includes three important aspects of sustainable development. Economic sustainability ensures individuals have access to a high level of living standard and that advantages are common similarly amid all individuals associated with the activities (Machnik, 2021). Wondirad et al. (2020b) believed that ecotourism might be utmost operative as an element of a wider conservation tactic of sustainable dimensions. Ecotourism development emphasizes social, cultural, and environmental aspects and contributes an important role to meet the challenges of world tourism sustainability. Utami et al. (2020) stated that ecotourism was set up to encourage the preservation of natural resources by expanding individual's mindfulness in their importance of MPAs. Ecotourism highlighted the ecological protection works with local communities and tourists, which could lead to the sustainable development of MPAs.

Ecotourism is learning-oriented and nature-based tourism that intending of being socioculturally, economically and environmentally sustainable (Wondirad et al., 2020a). The community-based ecotourism whereas members of the local community considered protectors

of natural resources and environmental sustainability. Teshome et al. (2020) stated that community-based ecotourism practices can contribute toward sustainable development which ensures the sustainable use of all-natural resources, for instance, social and economic needs can be attained through the preservation of ecological developments, cultural integrity, life support scheme, and natural diversity. Ecotourism frequently rises environmental awareness among residents. Thus, people need a better understanding of environmental issues to make a proper decision in environmental sustainability. Masud et al. (2017) point out that ecotourism can create required revenue for regional and local economies, increased local awareness on the significance of preservation, new incentives for governments, and inhabitants in and around attractive marine areas to protect them.

Ecotourism destinations are important for environmental sustainability in lessening the effect of pollution. Uddin et al. (2021) concerned about whether ecotourism can productively attain its objectives to contribute to environmental protection, economic growth, and social equity, and if it leads to exploitation and damage of MPA. It may ensure local people's well-being by helping them with change strategies and revenue earned from the tourism industry. Wang et al. (2021) pointed out that ecotourism can promote merging economic growth with environmentally sustainable development. Duffy (2006) highlights that tour operators, nongovernmental organizations (NGOs), environmental NGOs, and indigenous rights groups believe that ecotourism is a sustainable development strategy. Wang et al. (2021) focused on ecotourism and environmental sustainability is one of the important components comprising the triple-bottom-line. Bhuiyan et al. (2010) argued that the success of ecotourism can be attained by proper environmental education. Thus, ecotourism and environmental sustainability are related to each other.

Social sustainability is a process or life-enhancing conditions within a community that promotes wellbeing (Sen & Walter, 2020; Walter, 2020). Masud et al. (2017) assumed that ecotourism encourages local community participation to support social equity and reducing the risk of environmental damages, and in turn, lead to contribute a sustainable development of MPAs. The development of social sustainability entails social value and social equity (Beall et al., 2020; Kry et al., 2020). Social value suggests that all individuals under the community must have chance and access to resources, while social equity implies that people have equal rights, opportunities, a fair share of revenues, access to resources, and the right to participate in the decision-making process. Pieper et al. (2019) proposed two social indicators distinguishing social quality and social capital approach, which conceives social sustainability. Social sustainability is treated as a social residual category without theoretical conceptualization. Social quality, quality of life, and sustainability are the important concepts that require standards for evaluation, need expertise and best knowledge to explain what it means realizing social justice, solidarity, human dignity, equity and freedom in practices of daily life. Based on these arguments, we have postulated that:

H2. Ecotourism development has a positive impact on economic sustainability.

H3. Ecotourism development has a positive impact on environmental sustainability.

H4. Ecotourism development has a positive impact on social sustainability.

2.5 | Mediating effect of ecotourism development

Ecotourism development through the community participation might be crucial for sustainable development of MPAs. There are no previous studies that examine the mediating effect of ecotourism development on the relationship between community participation and economic, social, and environmental sustainability for the development of MPAs. Oviedo-García et al. (2017) examined the mediating role of the perceived value of ecotourism site and attitude toward ecotourism in sustainable development through ecotourism knowledge and satisfaction. No previous studies were examined the mediating impact of ecotourism development in the joint relationship between community participation and sustainable development of MPAs. The previous studies highlighted the impact of ecotourism knowledge on ecotourist satisfaction, the overall perceived value of the ecotourism resource, and attitudes toward ecotourism on satisfaction (Castellanos-Verdugo et al., 2016; Oviedo-García et al., 2017). Huang and Liu (2017) highlighted the mediating role of environmental concern and ecotourism for attracting tourist to revisit intention toward destinations. Oviedo-García et al. (2017) identified the mediating role of the perceived value of ecotourism site in the effect of ecotourism knowledge on ecotourism satisfaction. Ecotourism development is highly connected with community participation toward sustainable development of economic, environmental, and social sustainability, which will contribute to developing MPAs. Thus, we proposed that:

H5: Ecotourism development mediates the effect of community participation on (a) economic sustainability (b) environmental sustainability, and (c) social sustainability.

Based on the above literature review, this study attempts to draw the following proposed research model. The proposed framework indicates the community participation impacts ecotourism development, which ultimately influences economic sustainability, environmental sustainability, and social sustainability as shown in Figure 1.

3 | RESEARCH METHODOLOGY

3.1 | Operationalization of constructs

This study focused on the role of community participation in the development of ecotourism and its impact on the sustainable development of MPAs. The study used the SmartPLS algorithm through the

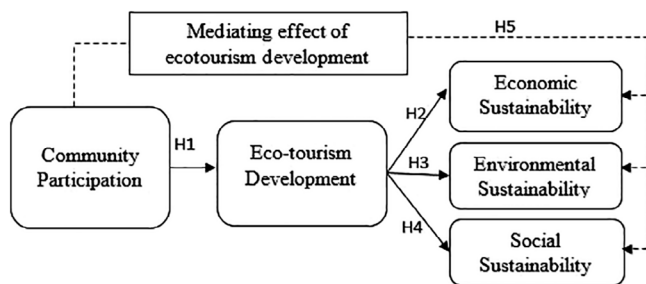


FIGURE 1 Proposed conceptual model

structural equation modeling technique to examine the causal relationship between endogenous constructs and endogenous constructs. Community participation is the independent variable, while ecotourism development is a mediator between community participation and economic, social, and environmental sustainability. The existing study followed a two-step analysis procedure using a partial least square (PLS) statistical tool in which the measurement model was evaluated for the confirmatory factor analysis and the structural model was assessed for hypothesis testing. The measurement items were developed based on the previous literature. Based on the Osman et al. (2018), Rodrigues and Prideaux (2018), and Mirsanjari (2012), three items were modified for evaluating community participation, and three items were adapted from Mondino and Beery (2019) and Geijzenendorffer et al., (2017) for measuring ecotourism development. Eleven items were modified from Huang and Liu (2017), Pieper et al. (2019), and Beall et al. (2020) to evaluate the economic, social, and environmental sustainability of MPAs. The measurement items for the independent variables were evaluated using a five-point Likert scale (e.g., 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree) whereas mediating and dependent variable were measured by seven-point Likert scale (e.g., 1 = strongly disagree, 2 = disagree, 3 = slightly disagree, 4 = neutral, 5 = slightly agree, 6 = agree, 7 = strongly agree).

3.2 | Survey administration and sample

The study collected data from Pangkor Island, Tun Mustafa Park, Sabah, Terengganu coastal areas like Redang and Perhentian Island. The research areas for the proposed study have been selected based on three criteria. For example, first, these selected coastal areas are full of human habitation from generation to generation. Consequently, the marine reserves are being endangered by the overpopulation due to their excessive utilization of the resources. Second, the socioeconomic condition of these selected areas is relatively poor. As a result, their dependency on marine resources is high which may also threaten the marine resources in no time. Moreover, third, the environment has been hugely degraded in the proposed study areas through human-made domestic wastages, excessive tourists visit round the year, oil and petrochemical dumping from the tourists' boats, overfishing, sewerage and garbage, use of excessive detergents, cultivation

of fish, fish feeding activities, plastic waste and so on. These have resulted in the rise of ocean temperature, an increase of ocean acidification, the rise of sea level, degradation of coral reefs, shortage of fresh water, coral bleaching, declining turtles nesting areas, decrease of fish production and many more on the islands. Overfishing is having drastic impact on the rise of ocean temperature. When too many fish are taken out of the ocean it creates an imbalance that can erode the food web and lead to a loss of other marine life (e.g., sea turtles, corals). Preventing overfishing will develop resilience and maximize long-term food and revenue potential.

To select an appropriate sample size G-Power version 3.1 was used. With the effect size of 0.15, G-Power software suggests a sample size of 160 to test the proposed research model with six constructs. To employ PLS-SEM, the minimum sample size is 100 (Reinartz et al., 2009). In this regard, this study managed to collect data from 320 respondents, which exceeded the minimum recommended sample size. Data was collected between 5th June and 14th September 2019, using a questionnaire survey from the study area. We distributed the questionnaire to the respondents through face-to-face interaction and explained the main objective of data collection. The questionnaire was divided into three sections. The first section contains some questions to capture the socioeconomic characteristics of the respondents. The second section consists of several items to measure community participation and the third section contains several questions to see the mediating effects of ecotourism and economic, social, and environmental sustainability. A total of 350 questionnaires with 320 were received from the household of Marine Park, indicating a response rate of 91%.

4 | RESULTS AND ANALYSIS

4.1 | Socio-demographic profile of the respondents

The findings revealed that out of 320 respondents, the majority of them were male (76.6%) compared to females (23.4%). The age group of the respondents was considered between 18 and above 60 years old. The findings revealed that a greater number of respondents' age group (33.3%) were from 46 to 60 years. The second larger group (27.1%) was between 31 and 45 years followed by 23.2% was from 18 to 30 years and 16.4% was 60 years and above. In terms of the marital status of the respondents, we found that the average number of a family member of households (married 72%, single 17%, and other 11%) was from MPAs and their highest profession was 29.1% of general workers followed by business (20.2%), tourism-related job (16.2%), others (11.1%), the government employees (9.0%), fisherman (8.3%), and housewife (6.1%).

4.2 | Measurement model assessment

Before the structural model assessment, we run the measurement model and test the confirmatory factor analysis to evaluate the

internal consistency of the existing study. We found that factor loadings meet the threshold of 0.70 (Hair Jr et al., 2016) except the items of ETDI, ENS2, and SS1 of the existing study. Sarstedt et al. (2019) pointed out that factor loading greater than 0.70 is good but a value between 0.40 and 0.70 can be dropped if AVE threshold is not attained the criteria. For this study, the lower loading was dropped until it meets the internal consistency. Table 1 shows the results of the convergent validity of the study. The convergent validity and discriminant validity were measured through the measurement model test. Convergent validity is “the degree to which indicators of a specific construct converge or share a high proportion of variance in common” (Hair Jr et al., 2016). To assess the internal consistency, we examine the factor loadings and the low loadings are respectively dropped for improving correlations among the constructs. All the factor loadings meet the suggested value of 0.70 (Hair Jr et al., 2016), except for ETD1 consecutively ENS2 and SS1. The results show that CR and AVE attained a significant level of 0.70 and 0.50 respectively, which meet the satisfactory level of convergent validity (Hair et al., 2010).

Based on the Fornell and Larcker (1981a) criterion, we decided to test the discriminant validity of this study. The results indicated that the average variance shared between each construct and its

measurement must be above the variance shared between the construct and other constructs. We found that all variables attain a satisfactory level of discriminant validity because of the square root of AVE value in the upper columns above compared to correlations for all variables (Table 2).

Table 3 shows the cross-loadings value of the constructs to evaluate the discriminant validity of this study. The findings demonstrated that all items loading were high on their variables, indicating a satisfactory level of discriminant validity. Hair Jr et al. (2016) pointed out that each indicator requires to meet high loading on its variable but low loading on the other variables.

Furthermore, Hensler et al. (2015) Heterotrait-Monotrait Ratio (HTMT) was also employed to ensure the discriminant validity of the existing study. The findings revealed that all the scores were below the HTMT criterion of 0.90, which meets the discriminant validity (Table 4). Hensler et al. (2015) and Gold et al. (2001) study suggested that the HTMT ratio could be a minimum of 0.85 and it should not be exceeded 0.90. Also, the result of the HTMT ratio indicated that the confidence interval was excluded 1 for any of the variables (Kline, 2015), which further supported the significance of discriminant validity.

TABLE 1 Convergent validity

Items of the construct	Loading	CA	rho_A	CR	AVE
Community participation		0.662	0.68	0.814	0.594
Community participation is needed for sustainable management of MPAs (cp1)	0.820				
Community participation will develop cooperation, collaboration, and social interaction among community members (cp2)	0.784				
Community participation will improve two-way communication between residents and local government (cp3)	0.704				
Ecotourism development		0.593	0.623	0.783	0.549
Community participation will make sure ecotourism development (ed1)	0.616				
Ecotourism development will create multiple livelihood opportunities for MPAs (ed2)	0.785				
Ecotourism development will protect natural resources within MPAs (ed3)	0.806				
Economic sustainability		0.787	0.8	0.875	0.7
Ecotourism development will improve economic well-being (ecs1)	0.832				
Business opportunities for residents will be available (ecs2)	0.813				
A community member will easily get a loan to start a business (ecs3)	0.864				
Environmental sustainability		0.703	0.711	0.816	0.525
Community participation will support for environmental conservation and development projects within MPAs (ens1)	0.744				
Natural habitats like coral reefs and biodiversity are safe from human interference (ens2)	0.687				
The fish catch will increase due to ecotourism development (ens3)	0.752				
Ecotourism development will conserve marine resources (ens4)	0.714				
Social sustainability		0.820	0.839	0.881	0.651
Ecotourism development will improve social well-being (ss1)	0.667				
Social interaction will increase among community members (ss2)	0.832				
The community will be involved with various associations/organizations (ss3)	0.845				
More socialization programs will be introduced (ss4)	0.869				

Abbreviations: AVE, average variance extracted; CA, Cronbach's Alpha, CR, composite reliability; MPAs, marine protected areas.

TABLE 2 Discriminant validity (Fornell-Larcker criterion)

Variables	(a)	(b)	(c)	(d)	(e)
Community participation (a)	0.771				
Ecotourism development (b)	0.822	0.741			
Economic sustainability (c)	0.377	0.431	0.837		
Environmental sustainability (d)	0.575	0.46	−0.02	0.725	
Social sustainability (e)	0.384	0.287	0.018	0.557	0.807

Note: The value on the top in each column shows the square root of AVE.

TABLE 3 Cross-loadings

Items	Community participation	Environmental sustainability	Economic sustainability	Ecotourism development	Social sustainability
Cp1	0.82	0.338	0.322	0.739	0.111
Cp2	0.784	0.365	0.427	0.618	0.416
Cp3	0.704	0.696	0.09	0.519	0.425
Ens1	0.504	0.744	−0.023	0.332	0.497
Ens2	0.34	0.687	−0.008	0.239	0.226
Ens3	0.439	0.752	0.043	0.397	0.267
Ens4	0.365	0.714	−0.079	0.334	0.61
Ecs1	0.357	0.006	0.832	0.351	0.055
Ecs2	0.196	−0.057	0.813	0.311	0.09
Ecs3	0.373	−0.005	0.864	0.408	−0.076
Ed1	0.351	0.347	0.149	0.616	0.307
Ed2	0.645	0.327	0.412	0.785	0.229
Ed3	0.758	0.364	0.349	0.806	0.149
Ss1	0.365	0.385	0.051	0.234	0.667
Ss2	0.262	0.472	−0.055	0.144	0.832
Ss3	0.274	0.47	−0.012	0.216	0.845
Ss4	0.312	0.469	0.04	0.283	0.869

TABLE 4 Heterotrait-Monotrait ratio (HTMT)

Variables	(a)	(b)	(c)	(d)	(e)
Community participation (a)					
Ecotourism development (b)	1.244				
Economic sustainability (c)	0.501	0.594			
Environmental sustainability (d)	0.874	0.701	0.1		
Social sustainability (e)	0.558	0.438	0.107	0.724	

4.3 | Structural model assessment

After the measurement model test, the study runs for the structural model assessment as it is important to determine the collinearity issues. The findings indicated that all the inner variance inflation factors (VIFs) for the constructs of community participation, ecotourism, and sustainable development were 1.8, 2.34, and 2.90 respectively, which indicates that the collinearity issue does not exist (Hair et al., 2010). Hair et al. (2011) argued that the VIFs ratio greater than five indicates the collinearity problem, while Diamantopoulos and Siguaw's (2006) study suggested that VIFs ratio higher than 3.3 may exist

a collinearity issue. Based on Table 5, the findings demonstrated that community participation has a highly significant impact ($\beta = 0.822$, p -value < 0.001) on ecotourism development. Thus, hypothesis (H1) is supported. The findings also showed that ecotourism development has a significant and positive relationship with economic ($\beta = 0.431$, $p < 0.001$), social ($\beta = 0.287$, $p < 0.001$) and environmental sustainability ($\beta = 0.460$, p -value < 0.001) respectively. Thus, H2, H3, and H4 were supported. For the predictive accuracy of the model, the coefficient of determination (R-square) was recognized to explain the variance in the endogenous construct. The R-square value of 0.67 in ecotourism development denotes that 67% of the total variance is

TABLE 5 Path coefficients and hypothesis testing

No	Hypothesis	Coefficient	Std error	t-value	R ²	f ²	Q ²	Decision
H1	CP > ETD	0.822	0.021	39.128**	0.676	2.083	0.135	Supported
H2	ETD > ES	0.431	0.050	8.555**	0.186	0.228	0.296	Supported
H3	ETD > ENS	0.460	0.047	9.790**	0.212	0.268	0.205	Supported
H4	ETD > SS	0.287	0.070	4.107**	0.083	0.09	0.383	Supported

Abbreviations: CP, community participation; ENS, environmental sustainability; ES, economic sustainability; ETD, ecotourism development; SS, social sustainability.

**p-value < 0.01.

TABLE 6 Mediating effect of ecotourism development

	Relationship					Confidence interval (BC)		Decision
		Std. beta	Std. error	t-value	p-values	LL	UL	
Ha	CP > ETD > ES	0.354	0.044	8.072	0.000	0.775	0.856	Mediation
Hb	CP > ETD > ENS	0.378	0.042	9.081	0.000	0.333	0.528	Mediation
Hc	CP > ETD > SS	0.236	0.059	4.032	0.000	0.151	0.402	Mediation

Abbreviations: BC, bias-corrected; CP, community participation; ENS, environmental sustainability; ES, economic sustainability; ETD, ecotourism development; LL, lower level; SS, social sustainability; UL, upper level.

explained by the community participation. Similarly, the R-square value of 0.18, 0.21, and 0.08 indicates that 18%, 21%, and 8% of the total variation in the economic, social, and environmental sustainability can be explained by ecotourism development.

The f^2 values were estimated based on the effect size of each construct to the R-square. Cohen's (1988) study postulated that f^2 values 0.35 is considered for high-effect size, while 0.15 and 0.02 were considered for medium and small effect sizes respectively. According to Table 7, the f^2 values of 2.083 for community participation signified a high effect on the R-square for ecotourism development while f^2 0.228 of ecotourism development denoted a moderate effect on the R-square for economic sustainability. Similarly, the f^2 value of 0.268 and 0.09 for ecotourism development indicated a moderate effect on the R-square for social sustainability and environmental sustainability respectively. The Q^2 value 0.13, 0.29, 0.20, and 0.38 indicated greater than zero, thus, it denoted that the model has predictive relevance (Fornell & Cha, 1994).

4.4 | Mediating effect of ecotourism development

Based on the summary results of mediating effect in the Table 6, ecotourism development mediates the relationship between community participation and economic sustainability ($\beta = 0.354$, $t = 8.072$), social sustainability ($\beta = 0.378$, $t = 4.032$), and environmental sustainability for the development of MPAs ($\beta = 0.236$, $t = 9.081$) at significant level 0.001 respectively. The 95% bias-corrected bootstrap CIs of the indirect effects (LL = 0.775, UL = 0.856), (LL = 0.333, UL = 0.528), (LL = 0.151, UL = 0.402) do not include 0, indicating that there is mediation (Preacher & Hayes, 2008).

5 | DISCUSSIONS

This study aimed to examine the relationship between community participation and ecotourism development for the determination of MPAs in Malaysia. Additionally, the main purpose of this study was to investigate the mediating role of ecotourism development between community participation and economic, social, and environmental sustainability for sustainable development of MPAs. The results revealed that community participation has significant positive influences on ecotourism development for the sustainability of MPAs. It denotes that ecotourism development ensures community participation for effective sustainable management as well as supporting environmental conservation practices, which could contribute to lead sustainable MPAs in Malaysia. This finding supports Osman et al. (2018) who believed that the preservation of natural resources and culture, as well as the participation of local communities, are key to the success of ecotourism development that leads to the sustainable development of MPAs. The nature of ecotourism development is facing challenges in implementing community participation (Rodrigues & Prideaux, 2018). If the local communities are associated with the management of ecotourism advancement projects and programs in MPAs, they could get benefit from their social and economic impacts and would accept the MPAs conservation strategies. In line with this, the development of ecotourism in MPAs can be perceived as a way to share benefits from biodiversity preservation.

The results reveal that ecotourism development has a positive and significant influence on economic, social, and environmental sustainability for the sustainable development of MPAs. This finding is related to Muhanna (2006) who recognized that ecotourism leads to social and economic management, which provide ecological

development, cultural integrity, life support scheme, and natural diversity. It is hoped that the local community can receive opportunities from the existing proposed sustainable development scheme if they are part of the process. The community-based initiative is essential for the development of ecotourism as a community leads to the business enterprises attaining sustainable development, and leads to support MPAs. Greater local community participation can assist them with extensive economic benefits, which leads to the sustainable development of MPAs. This finding supports the results of Sriarkarin and Lee (2018) and Tseng et al. (2019) who pointed out that community participation depends on economic facilities, which reflect local participants in the protection of cultural and natural resources. Ecotourism can provide economic benefits in long-term welfare for the local community and may assist continually to develop community infrastructure and sustainability of MPAs. There are three important sustainable development laws such as social value, economic efficiency, and environmental sustainability in community-based ecotourism development (Rodrigues & Prideaux, 2018). The participation of the local community plays a vital role to promote people and manage their economic resources, which can increase the sustainability of MPAs in the long run.

The global knowledge about biological success and social failure has emphasized that failure to supervise MPAs stems from ignoring the participation of local communities. The previous study (Mondino and Beery (2019) highlighted that indigenous communities' involvement is the fundamental operative management of MPAs. The participation of the local community for the effective and sustainable management of MPAs. Without community participation from preservation strategies on the management of MPAs are unfair to their privileges as well as devastating to protection. Thus, with the goal of sustainable preservation, policymakers, and government agencies must involve local communities in the management of MPAs. It is important to note that there is further a need to identify and promote social procedures that enable local communities to preserve and develop biodiversity as a part of their livelihood system.

This study also finds that ecotourism development mediates the relationship between community participation and economic, social, and environmental sustainability. This implies that ecotourism development and community participation is important in achieving the sustainability of MPAs. These findings are related to the result of Qiu et al. (2019) who indicated that economic sustainability is the ability of an economy to practices that help long-term economic development with distinctly affecting social, cultural, and environmental aspects of a community for the protection of natural resources. Environmental sustainability is a critical segment of ecotourism development that incorporates ecosystem integrity, climate, and landscape. The capacity to produce ecotourism depends on environmental protection and sustainable development (Ocampo et al., 2018; Roca-Puig, 2019) of MPAs. Social sustainability involves the ability of a community to develop processes and structure of MPAs that promotes wellbeing, designing service, housing, and government arrangements to help local communities.

6 | IMPLICATIONS

The findings of this study identified that community participation is important for the development of ecotourism, which in turn lead to the sustainable development of economic, social, and environmental in MPAs. Ecotourism can bring numerous benefits for the local communities including reducing poverty, and develop MPAs, created many local enterprises and aided local livelihoods. The involvement of local communities and the development of ecotourism could contribute to promoting the local culture and protection of natural resources. The development of ecotourism is might be noticeable through the rise of local enterprises (e.g., mini restaurants, guesthouses) in the MPAs, which could generate their livelihood and support their daily lives. This study supports the practice of local community involvement in ecotourism development to maintain the ultimate objective to preserve the natural resources from damages and to develop the economic standing of MPAs in Malaysia. Local communities are more concerned with the ecological safeguarding of MPAs. Local communities should join coral plantations to improve awareness of natural resources, and government should take initiative to develop the infrastructure of the local communities for their standard livelihood.

Community participation can assurance the preservation of natural resources, ensure local community participation in ecotourism development and activities to the protection of social privileges of local people, provide necessary training and skills to the local people, and incorporate the activities of the private and public sector. Community involvement in ecotourism development is a crucial strategy to generate revenue for the local people and increasing awareness of natural resources for the sustainable development of MPAs. All of the travel and tourism activities should be green for reducing gigantic waste generation allowing environmental management behavior. With assistance from the government, the local community can expand its tourism prospects to invest in travel and tourism-related organizations. Community involvement in ecotourism development can lead to the advancement of marine environments especially marine parks and other sustainable use categories of protected areas.

Ecotourism makes sure community participation and forms a foundation for sustainable development. The advancement of ecotourism makes fundamental resources accessible to the local community to protect its social and cultural heritage, improve the standard of living and offer economic possibilities. This can support the cultural improvement and environmental wellbeing of the community through sustainable economic development. Thus, by enabling the community involvement and lead ecotourism practices in the security of their living at homes through community participation, the economic-related problem, constraints resulting from social frustration and uncontrollable mistreatment of resources could be minimized. Basic administrative issues to be resolved include the correlation of government support, sustainable use of local resources, stakeholder participation in benefit-sharing programs, and growth of local institutions at regional and national levels, education, and training.

The findings of this study suggest ecotourism management practices to continue the economic development for preserving the

marine environment from destruction and improving the socioeconomic condition of MPCs in Malaysia. Ecotourism can assist to fulfill numerous demands and needs, for example, ensure community participation and management in ecotourism development, preservation of natural resources and protection of cultural resources. Ecotourism practices can assist people in conducting social research and mapping, gathering data, the consciousness of tourists, city exertion programs, training, and capacity building. Ecotourism is a crucial idea to create remuneration for the local community and raise consciousness for environmental protection. In line with these, all indicators of tourism and travel activities are required to minimize wastewater production, which may influence ecological preservation behavior, securing society, empowering women, and multiracial traditions. The development of ecotourism can contribute to the growth of economic development, job scopes and GDP growth of the country. Thus, effective management, a good understanding of the natural environment, ecosystems, and the ability to adapt any threats obligatory to be addressed instantaneously.

7 | LIMITATION AND FUTURE STUDY

The findings of this study indicated that community participants are a crucial mechanism for the sustainable development of MPAs. This study has examined the direct and indirect effect of ecotourism development to evaluate economic, environmental, and social sustainability. Future exploration should approach the association between tourists' word of mouth and environmentally responsible behavior. This study has examined the limited number of constructs such as community participation, ecotourism development, and environmental sustainability. Further investigation should look at whether environmental literacy, environmental sensitiveness, and local community enabling is a consequence of ecotourism development or whether it plays a moderating role in the association between environmentally responsible behaviors and sustainable development of MPAs in Malaysia.

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