

ENGAGING NEARBY POPULATION FOR DEVELOPING HALMAHERA WALKING SHARK HABITAT AS MARINE TOURISM POTENTIAL IN NORTH MOLUCCAS

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Abstract

*The Halmahera walking shark (*Hemiscyllium halmahera*) represents a unique marine species endemic to North Moluccas, Indonesia, with significant potential to become a focal point of sustainable marine tourism. This study explores the role of engaging nearby coastal populations in supporting the development of walking shark habitats as tourism assets. Data were obtained through community surveys and stakeholder interviews. Findings reveal that local communities demonstrate strong interest in marine tourism initiatives but require capacity-building in ecotourism practices, conservation awareness, and benefit-sharing mechanisms. Effective community engagement enhances stewardship of walking shark habitats, reduces the risk of unsustainable exploitation, and increases socio-economic resilience through alternative livelihoods such as guiding, homestays, and small-scale enterprises. The integration of community perspectives into tourism planning also fosters local ownership and long-term conservation commitment. The results emphasize that the success of marine tourism centered on the Halmahera walking shark depends not only on ecological suitability but also on the active participation and empowerment of nearby populations through inclusive management frameworks.*

Keywords: marine tourism; walking shark; ecotourism; community based-tourism

1. INTRODUCTION

The Halmahera walking shark (*Hemiscyllium halmahera*) is an endemic species found in the waters of North Maluku (Akbar et al., 2019). Dr. M. Erdman discovered this species in 2008 while diving at night in the waters of South Halmahera, Bacan Island, and Ternate Island (Nabillah et al., 2025). The Halmahera walking shark, distributed around Halmahera Island and its surroundings, has long been known to the local community. This species was later recognized when it was discovered by Gerard R. Allen, an Australian fish biologist, while conducting research in the Ternate Sea in 2013 (Akbar et al., 2019). Following this discovery, the Halmahera Walking Shark has become an important icon and the most sought-after attraction for divers during diving tours in the waters of Ternate and Halmahera (Akbar et al., 2019). The shark diving industry can contribute to the conservation of local shark populations, create jobs for local communities and generate user fees, raise awareness and support for sharks among the community, and advocate for action to be taken against shark fishing (Gallagher & Huveneers, 2018; Gonzales-Mantilla et al., 2021; Macdonald et al., 2017), all of which are effective forms of ecotourism.

In general, the local communities of Halmahera Island and its surrounding regions do not consume the Halmahera walking shark (*Hemiscyllium halmahera*). In several areas—such as Mare, Tidore, Ternate, and Jailolo—traditional ecological knowledge and local wisdom explicitly prohibit

the capture and consumption of this species (Akbar et al., 2023). However, anthropogenic pressures persist in the form of bycatch, consumption, collection for the aquarium trade, and use as a diving attraction (Akbar et al., 2023). Continued exploration and exploitation of the Halmahera walking shark pose significant threats to its habitat and population, including territorial disturbances, population decline, and disruption in the size and age structure of wild individuals (Akbar et al., 2023).

Tourism is recognized as a significant economic asset for many countries, particularly for small island nations, where it contributes substantially to economic growth, employment generation, and social development (Seetanah, 2011; Scheyvens & Momsen, 2008; Queiroz et al., 2014; Bhuiyan et al., 2016). Growing environmental awareness among the public has fostered more sustainable and responsible travel behaviors, thereby supporting the rise of ecotourism. Ecotourism is widely regarded as a viable strategy for enhancing the conservation of natural ecosystems while simultaneously fostering sustainable local development (Ross & Wall, 1999; Chen et al., 2020). It serves as an alternative approach aimed at protecting biodiversity and other natural resources, promoting their sustainable use, providing meaningful ecological experiences for tourists, raising environmental awareness, and delivering tangible benefits to local communities (Mosammam et al., 2016; Chen et al., 2020). Within community-based tourism frameworks, key elements such as community empowerment, incentive mechanisms, and participatory development are considered essential for effective and sustainable tourism management (Both et al., 2022).

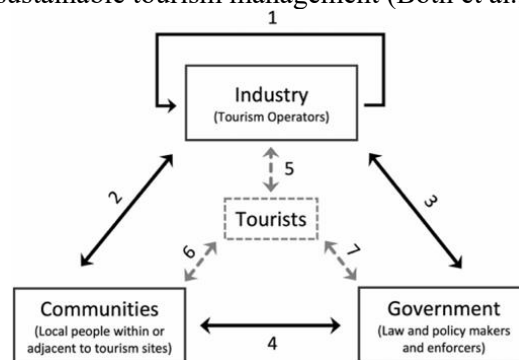


Figure 1. Tourism Management System (adapted from Thompson, 2026)

The concept of marine tourism centered on the Halmahera walking shark (*Hemiscyllium halmahera*), with active involvement of local communities, is grounded in the premise that direct economic benefits derived from biodiversity can incentivize local stakeholders to engage in its conservation (Salafsky & Wollenberg, 2000). Sustainable tourism is frequently promoted as a strategic approach to addressing global environmental and socio-economic challenges. Furthermore, tourism valuation studies are increasingly used to inform and influence policy decisions, encouraging governments and stakeholders to prioritize ecosystem and wildlife conservation efforts, as highlighted by Balmford and Whitten (2003), O'Malley et al. (2013), Spalding et al. (2017), and Tamayo et al. (2018).

2. RESEARCH & METHODOLOGY

2.1 Research Approach

This study adopts a descriptive research design using a mixed-methods approach, with a primary emphasis on qualitative inquiry. Data were collected through in-depth interviews and structured questionnaires, integrating both open-ended and closed-ended questions. While qualitative methods form the core of the analysis—aimed at capturing rich, contextual insights—a simple quantitative component was incorporated through closed questionnaires to support and reinforce the interpretation of key patterns and trends (Miles, Huberman & Saldana, 2014). The qualitative emphasis enables a comprehensive understanding of coastal community involvement in the

development of *Hemiscyllium halmahera* (Halmahera walking shark) habitat as a marine tourism asset in North Maluku. This approach facilitates the exploration of community perspectives, roles, participation, and socio-cultural dynamics in the context of community-based conservation tourism. Key stakeholders involved in this study include coastal communities in Ternate, Tidore, and Morotai.

2.2 Data Sources

The data sources in this study consist of primary and secondary data, which include:

1. Primary Data

Primary data in this study was obtained through:

a) Interviews

Primary data in this study were collected through semi-structured interviews, a method that employs open-ended questions to elicit detailed responses regarding participants' experiences, perceptions, and contextual understandings. This approach was selected for its effectiveness in generating rich, nuanced qualitative data, particularly concerning local community awareness of the *Hemiscyllium halmahera* (Halmahera walking shark) and their involvement in marine tourism development. Interviews were conducted face-to-face in selected coastal areas of Ternate, using an informal and conversational tone to create a comfortable environment (Elhami and Koshnevisan, 1994) that encouraged participants to respond openly and authentically. To facilitate discussion and ensure comprehension, visual prompts in the form of species photographs were presented at the beginning of each interview. This technique served as a cognitive stimulus to enhance participant engagement and familiarity with the subject matter. Key informants included fishmongers, university students, school students, and domestic tourists, selected for their varied perspectives and relevance to the research focus.

b) Mixed Questionnaire

Research data was obtained through the distribution of questionnaires to coastal communities living in the Ternate, Tidore, and Morotai areas. As it can't be open-ended completely (Nichols, 2009), the information was collected using a mixed questionnaire (open and closed) involving various community groups, such as fishermen, small business owners, local tour guides, and residents living around the coastal areas that are the habitat of the Halmahera walking shark. This mixed questionnaire allowed respondents to answer in the form of choices (closed) or descriptions (open), so that researchers could obtain simple quantitative data on the level of community involvement, as well as qualitative data describing their perceptions, experiences, and views on the development of walking shark habitats as potential sustainable marine tourism. The questions in the questionnaire were designed to capture the perspectives, knowledge, and level of involvement of respondents in walking shark conservation activities, as well as their potential in developing it as a conservation-based marine tourism attraction. The questionnaire is intended for the local community of North Maluku with 50 respondents, and it shown in Table 1 below.

Table 1. Respondent profile

Parameter	N	%
Gender		
Male	41	82%
Female	9	18%
Age		
< 20 years old	3	6%
21-30 years old	22	44%

Parameter	N	%
31-40 years old	9	18%
41-50 years old	8	16%
> 50 years old	8	16%
Latest education		
Primary	1	2%
Secondary	0	0
High School	16	32%
Diploma	2	4%
University degree	28	56%
Master/Doctorate degree	3	6%

Respondent data indicate that the majority of respondents were male (82%), with the largest age group falling within the 21–30 year range (44%). Respondents aged 31–40 accounted for 18%, while those over 50 represented 16% of the sample. Regarding educational attainment, most respondents held a bachelor's degree (56%), followed by high school graduates (32%). A smaller proportion had completed postgraduate education (6%), while only 2% had completed elementary school, and no respondents reported junior high school education. This demographic profile suggests that respondents are predominantly of productive age and possess relatively high levels of education. These characteristics imply enhanced access to information and a greater capacity for involvement in the development and conservation of Hemiscyllium halmahera habitats as a marine tourism asset in North Maluku.

2. Secondary Data

Secondary data in this study was obtained through the official website of the North Maluku Provincial Government to obtain data on hotels, creative economy business actors, accommodation, and events in North Maluku. Secondary data was also obtained through scientific publications related to Halmahera walking sharks, marine tourism development, and conservation in North Maluku. Secondary data was also obtained through scientific publications, research reports, and academic articles discussing the Halmahera walking shark, marine tourism development, and conservation efforts in North Maluku. The collection of secondary data is intended to strengthen the findings in the field, provide supporting context for qualitative analysis, and broaden understanding of the social, economic, and ecological conditions that influence the potential for developing shark-based conservation tourism in the study area.

2.3 Data Analysis

1. Interactive Analysis Model

Data analysis in this study used the Interactive Analysis Model (Miles and Huberman, 1994), which consists of three main stages: data reduction, data presentation, and conclusion drawing. This model was used to analyze the interviews results obtained.

a) Data Reduction

This stage involves the process of selecting, simplifying, and organizing raw data obtained from the interviews. Thematic analysis was used to identify patterns, categories, and relationships between themes that reflect the dynamics of coastal communities' involvement in the development of the Halmahera walking shark habitat.

b) Data Presentation

The reduced data is then presented in the form of descriptive narratives to show the relationship between the identified themes. This presentation makes it easier for researchers to see the relationship between social variables, such as conservation awareness, and the economic potential that arises from the development of Halmahera's walking shark-based marine tourism.

c) Conclusion and Verification

The final stage involves interpreting the results of the thematic analysis to formulate conclusions about the forms of community involvement and their implications for the development of sustainable marine tourism. Researchers conducted repeated verifications to ensure that the conclusions obtained were consistent, valid, and supported by empirical evidence from the questionnaire results.

2. Convergent Parallel Design

This study uses Convergent Parallel Design, which is the collection of quantitative and qualitative data and using them together to understand the issues in the study (Setiawati and Pritalia, 2023). The processing of closed questions uses descriptive statistical analysis by presenting data in the form of graphs and diagrams, while open questions undergo a coding process (Setiawati and Pritalia, 2023).

3. FINDINGS AND DISCUSSION

3.1 Implications of Existing Ecological Conditions

Based on interviews with various relevant parties, a number of critical issues were identified that require serious attention in order to ensure the sustainability of *Hemiscyllium halmahera* in North Maluku. The main findings can be summarized as follows:

1) Varying Levels of Public Awareness

There are varying levels of understanding among the public regarding the conservation status of walking sharks. Some respondents understand that this species is endemic and must be protected, while others still lack information. Limited socialization and education have resulted in low public awareness and increased the potential for exploitation.

2) Threats from Fishing Activities

Respondents reported that the practice of fishing for walking sharks, both directly and as bycatch, still occurs in the field. Although not yet a major commodity in the local market, this practice can have a significant impact on the already limited and vulnerable walking shark population.

3) Potential for Conservation-Based Tourism

Most respondents believe that walking sharks have great potential as a tourist attraction, especially for foreign tourists. However, the infrastructure and management of conservation-based tourism are still not optimal. Without planned management and adequate supervision, tourism activities have the potential to disrupt the walking shark ecosystem.

4) Knowledge Gaps and Education Needs

Public knowledge, including among students, about walking sharks is still very limited. Several respondents emphasized the importance of strengthening education through schools and social media. Without structured awareness raising, conservation efforts are unlikely to be effective.

5) The Role of Government and NGOs in Funding and Coordination

Limited funds and a lack of coordination between the government and non-governmental organizations are among the main obstacles to conducting research, procuring equipment, and developing conservation and tourism infrastructure. Funding support and cross-sector cooperation are urgently needed to strengthen the protection of walking sharks.

6) Local Wisdom as a Potential for Strengthening Conservation

Customary prohibitions on the consumption of certain marine life, including sharks, can actually be used as a basis for strengthening existing shark protection regulations. However, implementation is still not optimal due to violations of these prohibitions. Effective socialization support is urgently needed.

7) Promotion Strategies and Increased Community Participation

Respondents also highlighted the importance of promotion through social media and community involvement in tourism activities or local businesses. Increased community

participation is expected to strengthen a sense of ownership and responsibility for the conservation of walking sharks, while also encouraging local economic growth.

3.2 Nearby Population Perceptions of the Halmahera Walking Shark Habitat and its Development as a Marine Tourism Potential

Based on the data in Table 2, it appears that public awareness of the walking shark (*Hemiscyllium halmahera*) in their region is very high, with 82% of respondents already knowing about this endemic species. This shows that walking sharks have become part of the local knowledge of the community. In terms of ecological perception, the majority of respondents (72%) considered the walking shark to be very important to the marine ecosystem, while 18% said it was important, 6% said it was somewhat important, and 4% did not know how important it was. No respondents considered the walking shark to be unimportant, indicating a collective understanding of the ecological value of this species in the community.

In terms of tourism potential, almost all respondents (96%) realized that walking sharks could be a marine tourism attraction. Support for the protection of this species was also very high, with 98% of respondents agreeing that walking sharks should be protected from capture and habitat destruction. Only 2% did not know, and no respondents rejected protection efforts. Regarding regional development, 96% of respondents agreed that their area should be developed as a tourism destination based on walking shark conservation. However, the level of direct community involvement still varies, with only 20% feeling very involved and 32% feeling involved, while 24% are sometimes involved and 24% are never involved.

Public support for the development of conservation-based tourism is quite strong quantitatively, with 66% giving the highest support score (score 1), 4% score 2, 14% score 3, 4% score 4, and 12% with the lowest score (5). This shows that although general support is very high, there is a small portion of the community that does not fully support the initiative. The level of participation in marine conservation activities is also very high, with 94% of respondents having participated in activities such as beach cleanups, socialization, or coral transplantation. However, training experience in marine tourism is still limited, as only 60% have participated in such training. Nevertheless, interest in participating in the future is quite high, with 84% interested in being trained to be involved in the development of shark walking tourism, 12% possibly interested, and only 4% not interested.

Based on the closed questionnaire that was obtained, the local community's perception of the Halmahera walking shark habitat and its development as a marine tourism potential shows good results. This certainly becomes the basis for the development of conservative marine tourism based on the Halmahera walking shark. These results indicate that the community has a high level of awareness, concern, and willingness to participate in sustainable marine resource management. These findings form a significant basis for designing a strategy for developing marine ecotourism based on the conservation of walking sharks in Halmahera, involving the local community as the main actors in each stage.

3.3 Engaging Nearby Population

The involvement of local communities is an important element in the development of tourist areas in every aspect of tourism in the area (Islahuddin et al., 2022). Local communities should play an active role in obtaining maximum benefits from tourism development in the area (Islahuddin et al., 2022). Direct community involvement in tourism activities can increase community income beyond their daily activities (Islahuddin et al., 2022). Based on an open questionnaire that has been conducted, the following are examples of active involvement in the development of the Halmahera walking shark habitat as a potential marine tourism destination in North Maluku:

1) Conservative local tour guides

A guide is not only tasked with guiding visitors to locations, but must also have in-depth biological and ecological knowledge about *Hemiscyllium halmahera* in order to explain its

unique behavior, habitat, and conservation status to tourists. More than just verbal explanations, these educational efforts need to be reinforced with the presence of infographic boards strategically placed at visitor points. These informative and visual infographic boards serve as constant reminders that visualize scientific facts, distribution maps, and codes of conduct for interaction, so that the message of conservation can be conveyed more effectively and sustainably, even before the guiding activity begins. The synergy between competent guides and reliable information media creates a system that not only offers a unique tourist experience but also ensures the survival of this iconic species in its natural habitat.

2) Conservative dive guides

These dive guides are not only experts in navigating locations but also act as educators and guardians of underwater ethics. A comprehensive briefing before diving explains behavioral protocols, such as maintaining a safe distance, not touching, and not disturbing the Halmahera walking shark. Education about the biology and unique behavior of the walking shark is also provided to foster appreciation and a sense of responsibility in every tourist, so that an exciting diving experience can go hand in hand with strict conservation principles.

3) Souvenir Business

The development of a Halmahera walking shark souvenir business has a significant double impact, namely strengthening the local economy through new job opportunities and contributing to the strengthening of the branding and identity of the region. The unique and memorable walking shark icon significantly distinguishes the destination from other regions, creating a strong mental association in the minds of potential tourists. This strategy is not merely a promotional tool, but a long-term investment aimed at strengthening the image of the region in a sustainable manner. In addition, the use of this icon also fosters a sense of pride and ownership among the local community towards their natural wealth. Thus, these efforts not only focus on marketing aspects, but also encourage community involvement and love for their own environment.

3.4 Development Recommendation

The role of the local community is crucial in developing the Halmahera Walking Shark habitat as a potential marine tourism destination in North Maluku. However, the involvement of all stakeholders is equally important. The government plays a role in providing regulations and supporting infrastructure, while academics provide a strong scientific basis to support conservation efforts. On the other hand, businesses are responsible for marketing and professional tourism management, while NGOs are present to ensure that the principle of sustainability is maintained at every step. It is this harmonious collaboration between all parties that will transform this potential into a real sustainable tourism destination. With comprehensive support, Halmahera's Walking Shark ecotourism will not only have a positive economic impact on the community, but also serve as a concrete example of preserving endemic natural resources for future generations. Ultimately, the success of this initiative depends on striking a balance between economic exploitation and a commitment to preserving the ecosystem.

4. CONCLUSION

Based on these findings, the success of shark-based marine tourism in Halmahera does not only depend on ecological factors, but is also greatly influenced by integrative governance. The participation of local communities is central to planning and management, so this strategy has two main impacts. First, it fosters a sense of ownership among local communities, making them active participants in development. Second, it builds a commitment to long-term conservation because communities directly feel the economic benefits of ecosystem sustainability. Thus, an inclusive framework and community empowerment are not merely complementary but are the main foundations for transforming natural potential into sustainable, equitable, and resilient tourism.

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Appendix: Parameters

Tabel 2. Level of Community Awareness and Support for the Development of the Walking Shark Habitat as Marine Tourism Potential

Parameter	N	%
Are you aware of the existence of the walking shark (<i>Hemiscyllium halmahera</i>) in your area?		
Yes	41	82%
No	9	18%
In your opinion, how important is the existence of walking sharks to the marine ecosystem?		
Very important	36	72%
Important	9	18%
Quite Important	3	6%
No important	0	0
Don't know	2	4%
Did you know that walking sharks have the potential to be used as a marine tourism attraction?		
Yes	48	96%
No	2	4%
In your opinion, should walking sharks be protected from capture and habitat destruction?		
Yes	49	98%
No	0	0
Don't know	1	2%
Do you agree that your region should be developed as a marine tourism destination based on walking shark conservation?		
Yes	48	96%
No	2	4%
Do you feel involved in tourism activities in your region?		
Very involved	10	20%
Involved	16	32%
Sometimes	12	24%
Never	12	24%
Don't know	0	0
How much do you support the development of walking shark habitats as a potential marine tourism attraction in your area?		
1 (strongly high)	33	66%
2	2	4%
3	7	14%
4	2	4%
5 (strongly low)	6	12%

Have you ever been involved in marine conservation activities (e.g., beach cleanups, outreach, coral transplantation)?		
Yes	47	94%
No	3	6%
Have you ever been trained in marine tourism (guiding, homestays, crafts, local cuisine, etc.)?		
Ever	30	60%
Never	20	40%
If not, are you interested in being trained so that you can be involved in the development of walking shark habitats as a marine tourism potential?		
Yes	42	84%
No	2	4%
Maybe	12	12%