

Preserving cultural entity amidst growing ecotourism in Mabul Island, Malaysia

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Abstract

Ecotourism should promote environmental protection and improve the welfare of local communities. However, the changes brought by ecotourism are not always positive, raising concerns about the destruction of traditional lifestyles, environmental degradation and socio-economic inequalities. This study examines how the Suluk and Bajau communities on Mabul Island adapt to these changes and identifies strategies to strengthen their resilience while ensuring the sustainability of ecotourism. This qualitative study, using a scoping review, found that changes in land use and the economy on Mabul Island are linked to environmental degradation and human intervention. Communities involved in traditional livelihoods, such as fishing, demonstrate greater resilience as they are less dependent on the tourism economy. However, those relying on ecotourism activities, such as hospitality, tour guiding and transportation, face challenges when tourism declines. While tourism has brought economic benefits, it has also highlighted vulnerabilities, particularly in terms of dependence on external socio-economic factors and environmental damage. To enhance resilience, communities should promote sustainable ecotourism, preserve traditional knowledge and implement strategies to protect natural resources. Additionally, Mabul Island can combine various forms of sustainable tourism by adopting innovative strategies such as community-led tourism initiatives, stricter environmental regulations and promoting cultural tourism.

Keywords: Cultural preservation, ecotourism, environmental degradation, Mabul Island, resilience, sustainable tourism

Introduction

The tourism industry is worth billions of dollars and is a source of revenue for the world economy. Based on the World Travel Organisation in 2019, the estimated increase in tourist arrivals from 2010 to 2030 reflects an average increase of about 43 million international tourist arrivals annually during the period 1995 to 2010, compared to an average increase of 28 million per year (Akmaniza et al., 2022). Tourist destinations typically consist of various features, including accommodation, food, recreation, shopping and services, among others. All of these have influenced tourists' decision-making and affected their overall satisfaction (Shaliza et al., 2023).

One of Malaysia's growing tourism industries is Mabul Island which is located off the southeast coast of Sabah, Malaysia (Hamid et al., 2021). The island has emerged as a significant ecotourism destination, renowned for its rich marine biodiversity and vibrant cultural heritage (Malik et al., 2023). The island is home to the Suluk and Bajau people, whose traditional lifestyles are closely tied to their natural environment (Wu, 2023). As ecotourism continues to grow, it brings both opportunities and challenges for these communities, requiring a fine balance between preserving cultural identity and harnessing the economic benefits of tourism (Hasan et al., 2023). Furthermore, Mabul Island's marine life and natural beauty make it one of Malaysia's most sought-after destinations for island tourists (Mapjabil et al., 2016).

Therefore, the island may suffer from destruction if these essential tourism resources are not protected from degradation, especially from tourism activity (Yusoh et al., 2023). Unwanted consequences for Mabul's overall competitiveness may result from this. Concerning conclusions regarding this island's state have been reported by several investigations. In addition to many visitors, the island is also at risk from the negative consequences of overtourism, which include increased pollution, the commercialisation of public spaces and a diminished sense of place for the local population (Rahman & Omar, 2015). The nature and marine ecosystem may suffer from an increase in visitors, which could ultimately lead to environmental issues on the island (Ahmad et al., 2024). The problems with Mabul Island's attempt to introduce sustainable tourism brought to light the detrimental effects that mass tourism has had on the island (Othman & Rosli, 2023). There were reports that the overabundance of visitors had led to severe water shortages and an increase in trash mounds (Sundram & Gani, 2022). The correlation between tourism and the environment has demonstrated the existence of concerns that are exacerbated by mass tourism and require immediate response (Akmaniza et al., 2022).

Furthermore, the rapid development of ecotourism on Mabul Island has brought about significant changes in socio-cultural dynamics, land use patterns and environmental conditions. However, these changes are not always positive, with concerns about the decline of traditional lifestyles, environmental degradation and socio-economic disparities. It is necessary to examine how the Suluk and Bajau communities adapt to these changes and identify strategies that can increase their resilience while ensuring the sustainability of ecotourism. Therefore, this study aims to encourage tourism practices that not only preserve the natural environment but also respect and integrate local cultural elements into the ecotourism experience.

Literature review

Local communities and tourists

The people of Mabul Island are still very much attached to their long-standing customs and traditions, even though they live in limitations and poverty (Asmat et al., 2021). As a closed group, they have a different life from the modern world but still play a role in socio-economic and cultural aspects (Fu & Zhang, 2024). On the other hand, tourists come to this island only to visit temporarily, to enjoy the natural beauty and local culture, without experiencing the daily challenges faced by the local population (Marzuki et al., 2023).

For the local communities, Mabul Island is not just a tourist destination, but their home (Yusuf et al., 2021). They live, work and raise families there, making them an important part of the tourism experience offered by the island (Rahman & Omar, 2015). The involvement of local

communities in tourism is essential to presenting the authenticity that tourists expect (Ritonga et al., 2024). However, many local communities feel unable or not empowered to contribute optimally to the tourism industry, due to limited education and low wages (Yusoh et al., 2023). In addition, only a small proportion of the local communities are directly involved in tourism, especially young people (Drakopoulos & Poe, 2023; Flood et al., 2022). They usually work as support staff, while managerial positions are taken over by outsiders (Asmat et al., 2021). Other factors that influence community involvement are security issues such as kidnapping incidents in the area, as well as government regulations that restrict refugees from working so that only permanent residents are allowed to work in the tourism sector (Mapjabil et al., 2016). While local communities are often part of the tourist attraction, they also often bear the negative impacts of the tourism industry, such as environmental damage and cultural change (Jafar et al., 2022). Therefore, it is important for tourism management on Mabul Island to better engage local communities, with an empowering approach, so that they can support and benefit from tourism sustainably (Ahmad et al., 2024).

The concept of sustainable tourism

Sustainable tourism is a concept that aims to enhance the positive impacts of tourism on social, economic and environmental aspects while minimizing its negative impacts (Fajar et al., 2024). Future generations can enjoy the benefits of tourism without damaging the environment or local communities if these three aspects can be maintained in balance. This principle is also important in ensuring that tourism growth is not detrimental (Mulyani et al., 2022).

In addition, the balanced development of tourist destinations and the good experiences of tourists greatly influence their perception of the destination (Shaliza et al., 2023; Xu et al., 2023; Zeng et al., 2022). This involves good resource management, service preparation and coordination of facilities so that tourists have a quality experience (Molina et al., 2024). Research on tourism sustainability also shows that it is not only about environmental initiatives but must also include economic and socio-cultural dimensions (Ginanjari et al., 2024).

In recent decades, discussions on sustainable tourism have increased as public authorities have become increasingly aware of the importance of preserving natural and cultural resources (Hasana et al., 2022). Without appropriate measures, tourism can have negative impacts on the environment and communities (Haryanto et al., 2024). Therefore, a comprehensive approach to sustainability that involves social, economic and environmental aspects is essential to ensure a better future for tourism.

Method and study area

Scoping review

The use of systematic literature review procedures in documentary research methodologies is becoming more and more common across several disciplines, making it a dynamic and expanding field of study (Tang & Xu, 2023). As previously said, we carried out this review to guide our upcoming studies on ecotourism on Mabul Island. Thus, to characterise the research's focus, identify the socio-cultural dynamics of the Suluk and Bajau communities, explore the relationship between ecotourism and land use transformation, investigate the relationship between

socioeconomic shifts and community well-being, explore the resilience of coastal communities in the face of ecotourism and assess visitor satisfaction and the sustainability of ecotourism in Mabul Island, we swiftly conducted a scoping review. A scoping review is used to determine the nature and volume of available literature on a topic of interest, provide an initial synthesis of that literature and identify gaps in the existing literature/research on the topic (Pedrosa et al., 2022).

The researcher chose to perform a scoping review because these kinds of reviews work best in cases where a vast, complicated and or heterogeneous body of literature has not been thoroughly assessed concerning a proposed study, it is also the same thing explained by Dsouza et al. (2024). A scoping review's synthesis might be presented in tabular or descriptive form, as we do in this work. Scoping reviews are frequently carried out to ascertain the necessity of a comprehensive systematic evaluation of the literature and to help formulate the research topics for that study (Pedrosa et al., 2022). Rapid reviews are documented modifications of systematic review methodologies that are carried out to create speedy evidence syntheses when short deadlines apply, or resources are constrained. Standard systemic reviews normally take more than a year to complete (Dsouza et al., 2024). The online databases Web of Science, Google Scholar, JSTOR, Emerald Insight and Science Direct were searched to find literature discussing the environmental effects of ecotourism on Mabul Island for the scoping review that was reported in this study (Pedrosa et al., 2022).

The time range for the search was limited to studies published between 1 January 2010 and 1 September 2024, as the researchers were interested in past events on Mabul Island and recent studies were used because the researchers wanted to understand the current state of the island. The search turned up a lot of publications reporting research on Mabul Island. Therefore, to make sure that only the most pertinent papers were considered for review, the titles and abstracts of the publications were searched for terms related to ecotourism research on Mabul Island. This screening was carried out in tandem with the search that turned up the articles (Fig. 1). The following inclusion and exclusion criteria were used to determine whether to include publications that were chosen following the identification and screening step in the scoping review. For papers to be considered for inclusion in this scoping review, they needed to be published in English-language journals, include unique research findings and be freely available online in full-text format. After that, pertinent results from the included articles were taken out and examined.

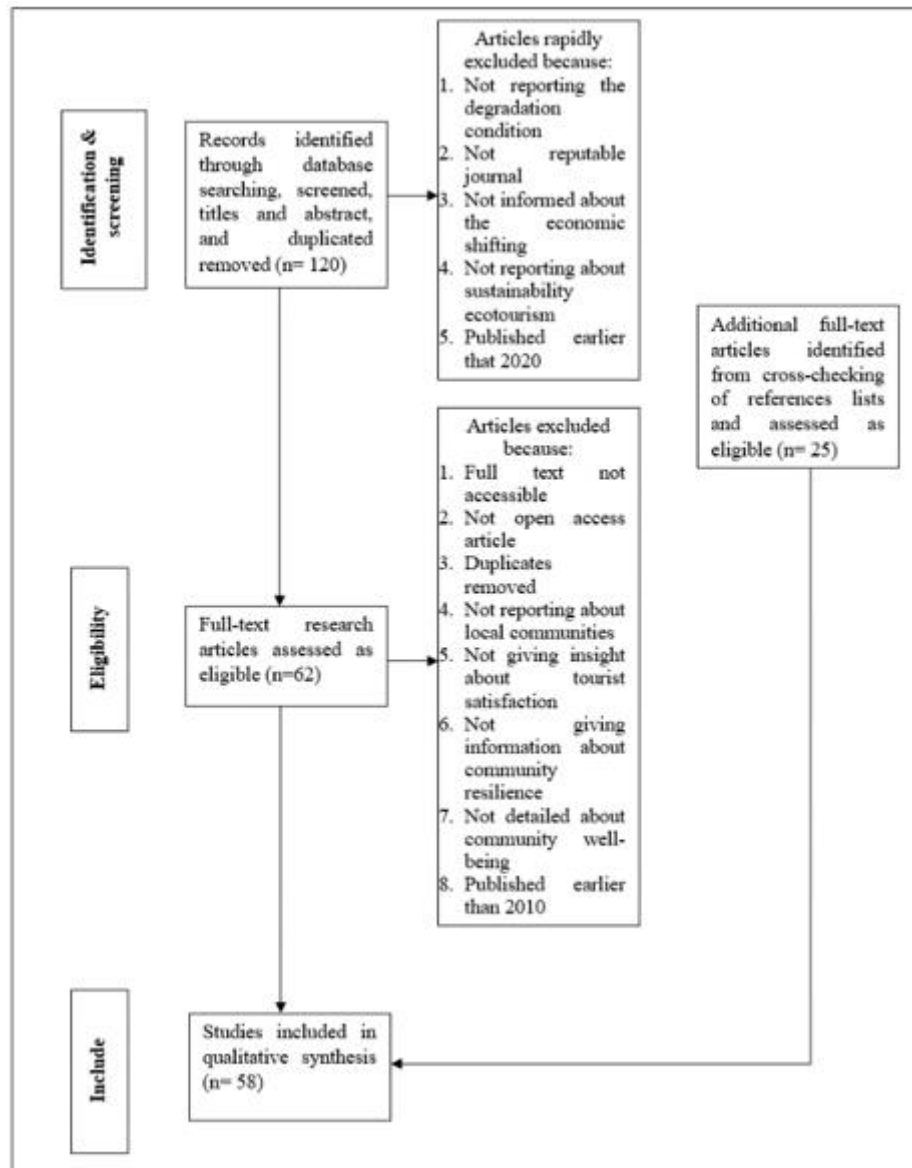


Figure 1. Preferred reporting items for systematic reviews expression for the rapid scoping review

Defining the research topics

As mentioned above, this study will identify the socio-cultural dynamics of the Suluk and Bajau communities, ecotourism and land use transformation, socio-economic shifts and community welfare, coastal community resilience in adapting to ecotourism and tourist satisfaction and sustainability of ecotourism on Mabul Island, Malaysia. The purpose of the study is to examine the integration of traditional lifestyles with modern ecotourism practices on Mabul Island. There are many topics related to ecotourism on Mabul Island, but researchers have not found anyone who has researched the resilience of communities living on Mabul Island to changes in the area. Therefore, this study also explains the resilience of communities to socio-economic and

environmental degradation and the integration of modern practices into traditional lifestyles. Furthermore, researchers also describe the picture of economic shifts at the research location. The location on Mabul Island can be seen in the picture below.

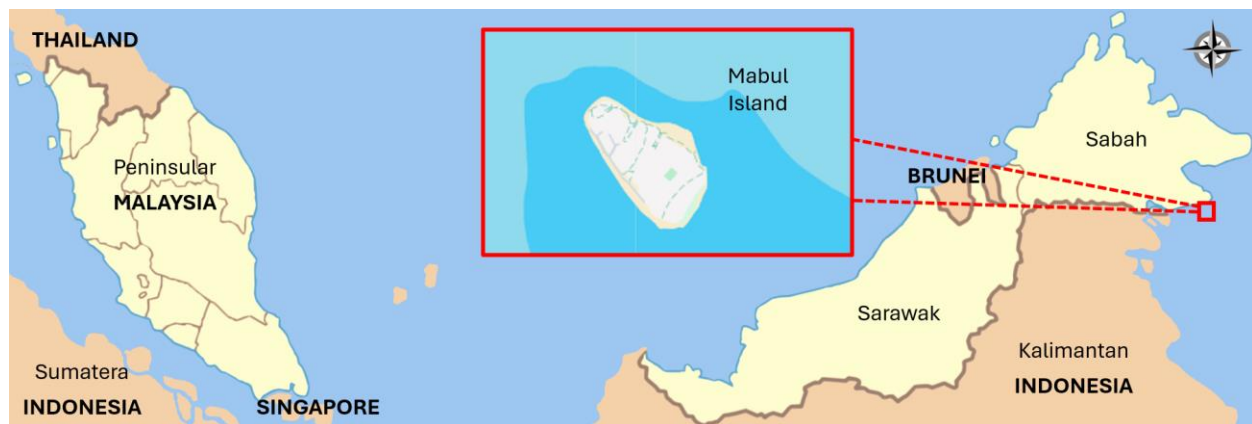


Figure 2. Mabul Island

Results and discussion

Socio-cultural dynamics of the Suluk and Bajau communities

It is known that Mabul Island is inhabited by 3318 people, which previously only numbered 130 people (Mapjabil et al., 2016). This number continues to change because there are still local communities who migrate to the Philippines and move to other places. As much as 60 percent of the total population on this tourist island are the Suluk Tribe and the Suluk Tribe is the majority community on Mabul Island (Lim et al., 2020). The Suluk Tribe is found in the Sulu Islands in the Southern Philippines and is known as Tausug, this community not only migrated to Indonesia but also abroad (Akmaniza et al., 2022). The majority of the community is Muslim and still strongly adheres to the customs and culture of their ancestors (Sundram & Gani, 2022). In terms of education, the Suluk Tribe only received formal education at the basic level. The Suluk Tribe has a strong sailing tradition and their skills are focused on navigation, fishing and maritime trade. Some of them are also involved in agriculture and small-scale trade, this result is also mentioned in Sundram & Gani research in 2022.

In addition to the Suluk community, there is also the Bajau community, the second largest community living on this island. Although the history and origins of the Bajau community on Mabul Island are still unknown and difficult to understand, based on stories, interviews and observations, it is clear that the Bajau Tribe once lived on Mabul Island and were an ethnic group of Bajau Laut identified as Palaut (Latip et al., 2023; Othman & Rosli, 2023). The community in the Philippines is widely spread throughout the maritime region of Southeast Asia, including the Philippines, Malaysia and Indonesia. Close to the Suluk community who depend on the sea, the Bajau people are traditionally sea nomads, although some have settled in coastal villages. They rely heavily on fishing and harvesting marine resources although some of them have settled in stilt houses built on the water or the beach, they maintain a strong connection with the sea. In addition, this ethnic group is less well-known and recognized by the community because Bajau musuk is

just a term given by the Suluk community to the Bajau Laut community living on Mabul Island (Latip et al., 2023). Most of the people are not religious and still adhere to animism. However, several families converted to Islam due to mixed marriages. When compared to the Bajau people who still live in the Mabul Island area, their lives are not much different, the only difference is their daily language and also their place of residence. However, the life of the Bajau people is better than that of the Palaut people. These research results are in line with the research of Mapjabil et al. (2016).

Both the Suluk and Bajau peoples have rich maritime cultures, with deep knowledge of the sea and marine life (Malik et al., 2023). Both societies also share similar socio-cultural characteristics, such as practicing traditional customs such as music, dance and oral storytelling, reflecting their seafaring heritage (Hafiz et al., 2024). Their social structures are tight-knit, with strong family and community ties. However, the Bajau have a better reputation as a highly communal society, often living in extended families.

Although they have many similarities, in the case of the relationship on Mabul Island between the two communities, the Suluk and Bajau communities are quite distant, they prefer to group and take care of themselves (Hasan et al., 2023). This causes them to be unable to unite in facing various threats. As a result, this causes their minimal knowledge of political involvement, which is very important to help them solve problems arising from tourism development (Akmaniza et al., 2022). Tourism development on Mabul Island will not take place without the involvement of external parties (stakeholders), the entry of tourism from external involvement indirectly weakens the social identity of the local community. The shift in their economic base from fishermen to tourism has weakened their culture and identity through the reduction of fishermen and their activities and slowly the skills needed to catch fish traditionally are forgotten. This causes all the old ways of the two communities to be replaced by new habits. In addition, foreign tourists dominate shared spaces and privacy, so peace is disturbed by tourism activities. The pressures and needs of life also contribute to reduced family interaction and weakened dependence between family members (Shaliza et al., 2023).

This means that activities such as sharing food and family visits have decreased due to increased pressure and the development of tourism activities. In this case, it can be concluded that tourism entering Mabul Island has a broad impact on social identity and in different contexts, has different levels of impact, some weaken or strengthen, some create or destroy. Now, Mabul is flooded with outsiders who come to invest or work in the tourism sector (Wu, 2023). This causes the people on the island to be unable to survive the various problems brought by tourism developers. Mabul Island tourism provides real freedom opportunities for local communities and allows the younger generation to appreciate working life and not just rely on the traditional primary economy, namely fishing.

Ecotourism and land use transformation in Mabul Island

According to Research (Adnan, 2020) the first worrying issue is the loss of live coral cover on Mabul Island, which is largely caused by destructive fishing practices, especially fish bombing by local communities (Malik et al., 2023). This illegal and highly destructive technique creates craters in the coral reefs, which severely disrupt the marine ecosystem (Shaliza et al., 2023). Coral reef inspection surveys confirm that new craters are still forming, indicating that fish bombing continues to be a significant threat. Coral reefs damaged by these bombs cannot recover naturally

due to the unfavorable conditions left behind, such as destroyed substrates, which are unsuitable for the re-settlement of coral larvae (Quigley & Baird, 2024).

The degradation caused by fish bombing is exacerbated by factors related to land use change (Armanto et al., 2023) and tourism expansion on Mabul Island. Rapid coastal development including the construction of resorts, piers and other tourism infrastructure contributes to sediment runoff, pollution and habitat destruction, which further weakens the already damaged coral ecosystem (Sutthacheep et al., 2024). This development leads to increased disturbances on land, such as erosion, clearing of coastal vegetation and the introduction of pollutants into the marine environment, all of which exacerbate coral reef degradation. This research result is also explained in Jayasekara et al. (2024) research.

This damage is not only ecological but also has significant socio-economic implications. Coral reefs provide vital ecological services such as habitat for marine species, coastal protection and biodiversity that support local fishing and tourism industries (Hamidi et al., 2023). When coral cover declines, the marine life associated with them suffers, leading to the loss of biodiversity and fish stocks. For communities that rely heavily on marine resources and tourism, the loss of coral reefs jeopardizes the local economy and the livelihoods of many residents. The tourism industry, which markets Mabul Island as a diving and snorkeling destination, relies on the health and beauty of these coral reefs. Coral reef degradation undermines the foundation of marine tourism, reducing the island's appeal to environmentally conscious travelers seeking a healthy and vibrant underwater ecosystem (Esparza-Huamanchumo et al., 2024).

Secondly, besides environmental degradation due to local community activities, the development of coastal infrastructure on Mabul Island, including the construction of breakwaters, jetties, resort facilities and channel dredging, has had far-reaching environmental, social and economic consequences. These projects, originally intended to promote tourism and protect the coastal area, have significantly altered the island's natural landscape. What is happening now is that critical coastal erosion is a direct result of the breakwaters and jetties disrupting natural tidal and sedimentation patterns, leading to the shrinking of sandy beaches and the loss of important habitat for marine and coastal species (Sutthacheep et al., 2024). In addition, channel dredging has further exacerbated these problems by altering water flows and destabilizing the coastline, causing the shape of the island to change over time.

This physical transformation has also been accompanied by the removal of vegetation, including mangroves and other coastal plants, which play a vital role in protecting the island from erosion and providing habitat for wildlife (Ritonga et al., 2024). As the island loses its natural defenses and beauty, the integrity of its ecosystem is compromised, directly impacting the quality of tourism the island can offer (Hamidi et al., 2023b). The development of resort facilities, while providing economic opportunities, has led to an unsustainable dependence on tourism, displacing traditional livelihoods such as fishing and agriculture. Socially, local communities face displacement and marginalisation, as land that was once used to meet their livelihood needs is now reserved for tourism infrastructure. If current trends continue, especially with the upcoming major projects, the island risks further environmental degradation, making it increasingly difficult to recover and offer a high-quality and sustainable tourism product (Sutthacheep et al., 2024). Continued unchecked development threatens to turn Mabul into an overcrowded and environmentally hazardous tourist destination, which in turn will reduce its appeal to environmentally conscious tourists.

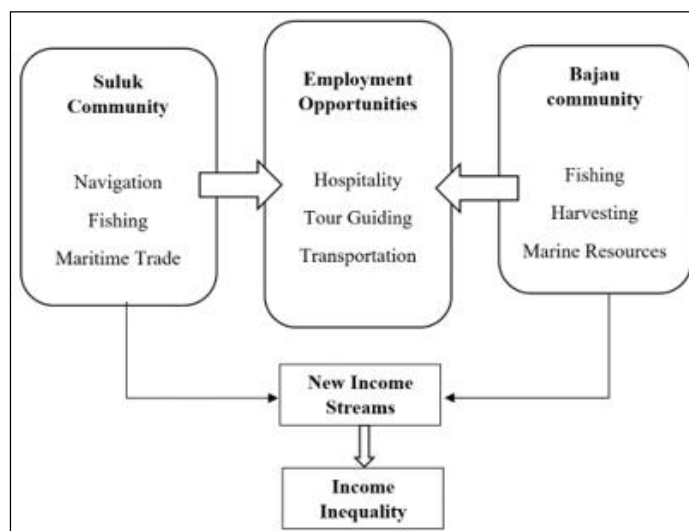
Rapid tourism development and population growth on Mabul Island have led to significant spatial and temporal changes in land use, which now reflect the urgent need for environmental

regulations and their strict enforcement (Sundram & Gani, 2022). As tourism infrastructure expands, private land is increasingly being converted often without considering sustainable land management practices. This has led to conflicts between tourism development and environmental conservation, as intensified land use for tourism disrupts local ecosystems and threatens natural resources. On Mabul Island, uncontrolled tourism development has also resulted in indirect source pollution, mainly through runoff of waste and pollutants into groundwater and coastal waters, which has severe impacts on water quality. This result is also explained in the research results of (Akmaniza et al., 2022).

Results obtained from the study by Hafiz et al. (2024) have shown that such land use practices can lead to significant water quality degradation (Syakina et al., 2024a), as pollutants from tourism and construction activities contaminate surface and groundwater resources. Ecotourism on Mabul Island faces challenges due to rapid population growth, which exacerbates land use pressures and contributes to the degradation of the physical environment (Syakina et al., 2024b). Population growth increases the demand for housing, services and infrastructure, which places additional pressure on the island's limited resources and fragile ecosystems. High population growth, combined with poorly regulated land-use practices, is one of the main drivers of environmental degradation, leading to loss of natural habitat, over-exploitation of resources and increased pollution (Syakina et al., 2024a). These factors undermine the core principles of ecotourism, which aim to promote sustainable tourism while preserving the natural environment. For Mabul Island to maintain its status as an ecotourism destination, it is essential to implement strict land-use regulations, ensure sustainable development and reduce the impact of tourism and population growth on the environment. Without such measures, the island risks losing the ecological assets that attract visitors and support the local economy.

Socio-economic shifts and community well-being

Below is an illustration of the socio-economic transformation induced by ecotourism in Mabul Island for community well-being.



Source: Created by the author

Figure 1. Socio-economic transformation

The socio-economic landscape of Mabul Island has undergone significant transformation due to the rise of ecotourism. Ecotourism has created new income streams for local communities, mainly through employment in hospitality, tour guides and environmental services (Sundram & Gani, 2022). Previously, their income was derived from traditional livelihoods such as navigation, fishing and maritime trade as skills of the Suluk Community, while the Bajau also fish as they are heavily dependent on the sea, harvest and marine resources. The influx of these economic activities has improved the standard of living of many islanders, giving them better access to resources and infrastructure (Akmaniza et al., 2022). However, the distribution of these benefits is not always equitable, with some groups benefiting more than others. While ecotourism has created many employment opportunities, not everyone on the island has equal access to them. Ecotourism jobs often require specific skills, such as language proficiency or experience in the tourism industry, which may not be available in some areas. As a result, there is a gap in the distribution of income, with certain individuals or families benefiting more from tourism, while others are left behind. This growing inequality can lead to tensions within communities, particularly between the Suluk and Bajau ethnic groups (Lim et al., 2020).

The changes brought about by ecotourism have also impacted the social fabric of Mabul Island. The influx of visitors and new business opportunities have changed traditional lifestyles and social dynamics (Sundram & Gani, 2022a). In some cases, these changes have fostered stronger bonds within communities by promoting collective involvement in tourism projects. However, inequality in income and access to resources has the potential to strain relationships and weaken social cohesion, which can ultimately affect the overall quality of life for the Suluk and Bajau communities. This research also has the same explanation with Notohamijoyo et al. (2021) research results.

Community resilience in the face of ecotourism

Tourism on Mabul Island is said to be built in an unstructured manner and exceeds the natural capacity of the surrounding area (Hamidi et al., 2023). In addition, tourism on the island has violated most of the established environmental, social and economic development principles. The study results from Jayasekara et al. (2024) show that the fear of the people on Mabul Island is not of violators or terrorists but of the government. Their true nature is that they live in fear, they are afraid that if they act rashly, the government will return them to the Philippines. This is what causes them to not have high bargaining power in the eyes of the government, even though they are aware that Mabul Island's environment is in poor condition, in other words, the nature of Mabul Island is starting to be threatened (Hasana et al., 2022). The tourism and ecotourism industries have brought about significant socio-economic changes, environmental degradation and the integration of modern practices into traditional lifestyles. Further explanation can be seen in the table below.

Table 1. Linkage of changes and communities activities adaptation in Mabul Island

Changes on Mabul Island	Parameters changes	Explanation
Socio-economic	Increased income from tourism	Job in diving resorts, homestays and guiding services
	Shift from traditional livelihoods	Transform traditional methods in way of finding livelihood and change into work in a tourism-related job
	Inflation and cost of living	Tourism trends increase the cost of living
Environmental degradation	Pressure on natural resources	Pollution, overfishing and damage from inexperienced divers
	Waste management issues	Improper waste disposal such as plastic pollution
	Erosion and land use	Coastal erosion and habitat loss
Integration of modern practices into traditional lifestyles	Cultural shifts	Changes in social behavior, clothing, language and other cultural elements
	Loss of traditional knowledge and skills	Decline of traditional knowledge due to the shifting of tourism-related employment

Source: Created by the author

Socio-economic changes in Mabul Island are classified into three main parameters, namely Increased income from tourism, shifting from traditional livelihoods and inflation and cost of living. Although we know that tourism has provided many economic benefits to local people on Mabul Island such as jobs in dive sites, homestays and guide services that can improve their livelihoods. However, the distribution of income is uneven (Esparza-Huamanchumo et al., 2024). Local communities may work in low-wage service jobs, while large tourism operators are often from outside and dominated by the industry. The profits from tourism flow to external businesses, creating economic disparities. In their research, Sundram & Gani, (2022) stated that among the problems that caused this to happen were the absence of identity cards in the local community, the absence of secondary schools on Mabul Island and the lack of parental awareness of the importance of education. The problem of identity cards is a major problem for residents of Mabul Island. This problem not only causes them to be unable to go to school but also to present themselves in the tourism sector that is being developed on the island. If they accept to work in the tourism sector, the salary paid is around RM300 – RM400 per month without realizing that they can only be spectators and the benefits of tourism are obtained by others (Sodikovich, 2023). Before tourism, the community relied on fishing as their main source of income. They depended on the sea and had a strong connection to it. With the growth of tourism, many residents shifted to jobs related to tourism (Hafiz et al., 2024). Although salaries are more consistent, they are closely tied to tourist arrivals, which can fluctuate due to global crises that can affect the stability of the community. Local communities also struggle to keep up with rising living costs, leading to socio-economic disparities (Haryanto et al., 2024; Notohamijoyo et al., 2021).

The second change is environmental degradation due to pressure on natural resources, waste management issues and erosion and land use. Marine ecosystems have been subject to pressure on natural resources due to tourism activities. Coral reefs, which are vital to the island's economy and ecology, are threatened by pollution, overfishing and damage from inexperienced divers. Furthermore, unsustainable fishing practices, often associated with the increasing demand for seafood in tourist areas, have contributed to the depletion of marine resources (Akmaniza et al., 2022). In addition, the rapid development of tourism infrastructure has outstripped the island's waste management capacity. Furthermore, improper waste disposal, including plastic pollution, has led to environmental degradation (Syakina et al., 2024a). This pollution affects both marine and terrestrial ecosystems, impacting the health of local fisheries and wildlife (Syakina et al., 2024a). Furthermore, the island's capacity to handle sewage and other waste products from hotels and resorts is often inadequate, leading to water pollution and a decline in the island's natural beauty. The development of resorts and dive centers has led to coastal erosion and disrupted traditional land use patterns of local communities, affecting agricultural activities and other land-based livelihoods (Jayasekara et al., 2024).

Cultural shifts and loss of traditional knowledge and skills are part of the integration of modern practices into changing traditional lifestyles. Tourism activities have brought modern practices and global culture to local communities. Younger generations, especially those involved in the tourism sector, adopt more modern lifestyles, sometimes at the expense of traditional customs (Ritonga et al., 2024). The integration of modern practices has created a generation gap, where younger individuals are more likely to adopt Westernized lifestyles, while older generations may seek to preserve traditional ways (Xu et al., 2023). Traditional activities such as fishing techniques and maritime skills are slowly disappearing and no longer identify with local communities. With fewer young people involved in traditional livelihoods, there is a risk that this knowledge may not be passed on to future generations, weakening the cultural resilience of communities.

From all the events described above, if this situation is linked to community resilience, it will result in resilience in the face of socio-economic, environmental and modern practices degradation. During the COVID-19 pandemic, many communities that rely on tourism-related jobs face economic vulnerability due to a lack of income diversification due to stagnant tourism activities (Ritonga et al., 2024). Those who are still engaged in traditional livelihoods, such as fishermen, have shown greater resilience because they are less dependent on the tourism economy. However, this has increased environmental degradation due to declining fish stocks due to overfishing and leading to unsustainable practices (Armanto et al., 2023). Not only that, the degradation of the marine and terrestrial ecosystems of Mabul Island has threatened the long-term sustainability of tourism and traditional livelihoods. The ability of communities to adapt to environmental changes, such as declining fish stocks and coral reef damage, is critical to community resilience. Efforts to promote ecotourism and marine conservation have emerged as potential solutions to environmental challenges (Shaliza et al., 2023; Sodikovich, 2023). These initiatives, which focus on sustainable tourism practices and the preservation of the island's natural resources, are critical to maintaining community resilience in the face of environmental degradation.

In terms of cultural resilience, the lack of knowledge and traditional customs among the younger generation threatens the sustainability of the culture of the indigenous people on the island. This condition also causes some young people to leave the island to look for better jobs. On the other hand, as a result of this condition, some of them make local crafts and put on cultural

performances to introduce traditional culture to the world of tourism (Hamid et al., 2021). This means that they preserve cultural heritage while gaining economic benefits from tourism. In addition, the challenge faced by the people on Mabul Island is finding a balance between modernisation caused by tourism and maintaining their traditional way of life. Ecotourism initiatives that promote sustainable practices while preserving cultural heritage can help bridge this gap (Ahmad et al., 2024; Hasan et al., 2023; Wu, 2023). This includes training local people in environmental management, sustainable fishing practices and environmentally friendly tourism management to empower communities to manage their resources and maintain resilience in the face of change. This result is in line with Lew, (2013) research results.

Tourist satisfaction and the sustainability of ecotourism in Mabul Island

Tourist satisfaction is a key driver of the long-term sustainability of ecotourism, especially on Mabul Island, where the natural environment, cultural experiences and local infrastructure serve as the core attractions. The quality of the island's beaches, coral reefs and marine biodiversity plays a significant role in shaping tourists' experiences (Esparza-Huamanchumo et al., 2024; Jayasekara et al., 2024). Likewise, authentic cultural interactions with the indigenous Suluk and Bajau communities enhance the appeal of the destination by offering unique insights into traditional lifestyles. However, maintaining high levels of satisfaction is challenging because mass tourism can lead to environmental degradation, strain on local resources and disruption of community traditions (Eko Baroto Waluyo & Bambang Guritno, 2023; Pinem et al., 2021).

To ensure sustainable tourism practices, Mabul Island must balance between preserving its pristine environment and providing modern amenities catering to tourists. Factors like developing eco-friendly infrastructure, conserving coral reefs

and managing waste generated by tourists is vital in protecting the island's natural assets. However, tourism must be designed in a way that minimizes negative impacts on local communities. Excessive commercialisation of cultural experiences, for instance, can lead to a loss of authenticity, which would diminish both tourist satisfaction and community well-being.

Below are five workable actions, along with innovative ideas from this research. In order can achieve long-term sustainability while integrating modern ecotourism and traditional lifestyles on Mabul Island, small but impactful actions can support environmental conservation and community well-being.

Table 2. Innovative sustainability tourism in Mabul Island

Sustainability tourism types	Action	Innovation
Promote community-based ecotourism	Involve local Suluk and Bajau communities directly in managing ecotourism activities, such as providing guided tours, homestays and cultural workshops	This action empowers locals by providing economic benefits and ownership over tourism activities
Implement waste management programs	Establish a community-driven waste management system with a focus on recycling, composting and reducing plastic use,	Waste management can be supported by local craftspeople using recycled materials to

	particularly for tourism businesses and visitors	create products that can be sold to tourists
Eco-friendly transportation and activities	Introduce low-impact methods of transport for tourists to minimize the carbon footprint and reduce noise pollution in marine ecosystems	If the shifting to renewable energy-driven transport systems can work, Mabul Island can create a unique selling point as an eco-friendly destination, attracting environmentally conscious tourists while protecting its fragile ecosystem
Support coral reef conservation through	Set up an adopt a reef initiative	This fosters direct tourist engagement in conservation, ensuring tourists feel a personal connection to the island's biodiversity
Educational Eco-Tourist Programs for Schools and Visitors	Develop educational programs aimed at teaching tourists and local children about sustainability practices, marine life protection and responsible tourism behavior	It can teach tourists about the symbiotic relationship between the community and nature

Source: Created by the author

In terms of future sustainability, Mabul Island can combine various types of sustainable tourism. The first type is community-based ecotourism, which can preserve their culture by authentically showcasing traditional ways of life. Tourists will gain a more meaningful experience, which can lead to higher satisfaction and return visits. However, it is important to consider that local communities need to improve their education to have good knowledge. Local communities can combine traditional lifestyles with modern ecotourism practices by adopting small community-focused actions that promote a balance between tourism growth and environmental conservation. One such action is community-based tourism, where local people take an active role in tourism activities such as providing accommodation, guiding tours and showcasing traditional crafts or culinary experiences. This empowers local people economically and ensures that the cultural identity of the community is maintained (Fajar Subkhan et al., 2024; Notohamijoyo et al., 2021).

In addition to empowering local communities and business owners in tourism activities, implementing waste management programs can add value to waste materials while generating additional income for the community. The third type of sustainability action is environmentally friendly transportation and activities. If communities can introduce low-impact transportation methods for tourists to minimize their carbon footprint, they can create a unique selling point as an eco-friendly destination (Ginanjar et al., 2024; Latip et al., 2023; Molina et al., 2024). Combining small-scale initiatives such as environmentally friendly transportation for example electric boats, promoting low-impact diving practices and organizing beach cleanups involving tourists can be very effective. These initiatives not only reduce the environmental footprint of tourism but also involve visitors in the conservation process, increasing their overall satisfaction and creating awareness of sustainability issues.

Set up and adopt a reef initiative, where tourists can contribute to coral reef conservation efforts, such as planting coral fragments or sponsoring reef restoration projects. It not only helps preserve the coral reefs but also educates tourists on the importance of maintaining marine ecosystems (Quigley & Baird, 2024). Lastly, an ecotourism program is also good for visitors as an educational aspect can be expanded to include interactive workshops, teaching tourists about the symbiotic relationship between the community and nature, which can create more mindful tourism behaviors. These initiatives will have a long-term impact on protecting Mabul's environment by promoting a culture of sustainability (Quigley & Baird, 2024; Sutthacheep et al., 2024).

Limitations

This study presents several limitations that should be acknowledged. First, the use of a rapid scoping review approach, although practical for time-constrained research, may not provide the depth and comprehensiveness offered by full-scale systematic reviews or empirical fieldwork. The limited timeframe and resources may have resulted in the omission of relevant grey literature, policy documents, or unpublished community-based reports that could offer additional context or alternative perspectives.

Second, this study relied heavily on secondary data published in English and indexed in selected academic databases. Consequently, valuable information available in other languages or localised formats especially from indigenous voices, community organisations, or local governments may have been overlooked, potentially limiting the diversity of viewpoints represented.

Third, the absence of primary data collection through field engagement means that the study lacks direct input from the Suluk and Bajau communities. While the literature provides important insights, the lived experiences, cultural expressions and adaptive strategies of the local people could not be captured in detail. This limits the depth of understanding regarding the socio-cultural impact of ecotourism and the real-time resilience strategies of the communities.

Lastly, tourism development and environmental change are dynamic and continuously evolving processes. As the scoping review was based on literature published up to September 2024, the findings may not fully capture more recent developments, interventions, or policy changes occurring on Mabul Island. Future studies should consider using longitudinal designs, participatory research methods and community-based data collection to strengthen the reliability and relevance of the findings.

Recommendations

Recommendations for innovative strategies to strengthen the sustainability of ecotourism on Mabul Island, emphasizing community involvement, environmental protection and cultural preservation. The strategy encompasses all forms of sustainable tourism designed to ensure that tourism benefits the island both economically and ecologically while maintaining the unique cultural identity of the Suluk and Bajau people. For more details, please refer to the key points below:

Community-led tourism initiatives

This strategy allows local communities to manage tourism in a way that is in line with their cultural values and environmental priorities. The innovation of this strategy is to establish a local cooperative that manages all ecotourism activities, which can empower communities to retain profits and reinvest in sustainable projects. The cooperative can also act as a regulatory body, ensuring that tourism is conducted in a way that is in line with community values and environmental goals.

Stricter environmental regulations

This is a critical strategy to manage the impact of ecotourism on the fragile ecosystems of Mabul Island, such as coral reefs and marine biodiversity. It may provide strict control in diving, fishing and waste disposal so it can reduce environmental degradation. Implementing a carrying capacity mode can prevent over-tourism. This could be accompanied by green certifications for local businesses, which would encourage them to adopt eco-friendly practices, such as using renewable energy or biodegradable materials.

Promotion of cultural tourism

Cultural tourism that respects and preserves the identity of the Suluk and Bajau people is essential to maintaining the cultural integrity of Mabul while also benefiting from tourism. Promoting traditional fishing, boat building, crafts and festivals as part of the tourism experience allows visitors to engage deeply with the island's heritage. However, these activities do not need to be commercialised to the point of losing their cultural value. Developing cultural immersion packages where tourists stay with local families and participate in daily life can provide meaningful exchanges. These packages should be designed to respect cultural boundaries, with community oversight to prevent exploitation. In addition, partnerships between the tourism industry and cultural preservation groups can ensure that traditional practices are maintained and not altered to meet tourist expectations.

Conclusion

Mabul Island is predominantly inhabited by the Suluk and Bajau communities. Despite sharing a maritime culture and a close-knit social structure, the Suluk and Bajau communities in Mabul are somewhat isolated from each other and less involved in politics, which hampers their ability to address issues arising from tourism. As tourism has expanded, it has led to a decline in traditional fishing practices and disrupted family interactions, while increasing the presence of outsiders and shifting the local economy away from fishing. This transition offers new opportunities but also challenges the island's identity and social cohesion.

Mabul Island faces severe environmental challenges due to destructive fishing practices such as blast fishing and uncontrolled tourism development. Blast fishing creates craters in the coral reefs, preventing recovery and damaging the marine ecosystem. Expanding tourism, including the construction of resorts and infrastructure, exacerbates this by causing sediment runoff, pollution and habitat destruction. These problems not only damage the coral reefs but also

threaten local fisheries and tourism, which are vital to the island's economy. Coastal infrastructure projects disrupt natural processes, leading to erosion and loss of critical habitat. In addition, rapid population growth and inadequate land-use regulations contribute to water pollution and environmental degradation. Strict environmental regulations and sustainable development practices are essential to maintain Mabul's appeal as an ecotourism destination.

Tourism on Mabul Island has caused significant changes, both positive and negative. Economically, tourism has increased income opportunities but has also created income inequality and increased the cost of living. Environmentally, tourism has caused degradation due to overfishing, pollution and inadequate waste management. Culturally, tourism has introduced modern practices, leading to the loss of traditional knowledge and generational gaps. The COVID-19 pandemic has further exposed the vulnerability of communities due to their heavy dependence on tourism. To build resilience, Mabul Island needs to focus on sustainable eco-tourism, preserving cultural heritage and managing natural resources effectively. Meanwhile, from a sustainability perspective, ecotourism on Mabul Island relies on integrating modern practices with traditional lifestyles while protecting environmental and cultural assets. Stricter regulations and promotion of cultural tourism offer long-term solutions to prevent environmental and social degradation.

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