

Eco Tourism: Studying Sustainable Tourism Strategies from a Triple Bottom Line Perspective in the Mangrove Forest Area of Bali

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Abstract

Purpose: The purpose of this study was to analyze sustainable tourism strategies in the Bali Mangrove Forest area using the Triple Bottom Line (TBL) approach, focusing on its economic, social, and environmental impacts.

Methodology/approach: This study employed a literature review method to examine various academic sources and policy documents related to ecotourism management in the Ngurah Rai Grand Forest Park (Tahura), Bali. The research framework was based on the Triple Bottom Line approach, evaluating the sustainability aspects of ecotourism.

Results/findings: The findings revealed that ecotourism in the Bali Mangrove Forest provides economic benefits by increasing local community income through fisheries and tourism activities. Socially, community participation in ecotourism enhances environmental awareness and engagement in conservation efforts. From an environmental perspective, ecotourism supports mangrove preservation through collaborative conservation programs involving local communities, government, and private sectors.

Conclusions: Ecotourism in the Bali Mangrove Forest demonstrates the potential of the TBL approach to balance economic, environmental, and social objectives. It strengthens community livelihoods, fosters conservation awareness, and ensures ecological sustainability. The success of this model highlights the importance of integrating community involvement and cross-sectoral collaboration in sustainable tourism strategies.

Limitations: The study relies solely on secondary data without field observations or quantitative measurement of impacts, limiting the depth of empirical validation.

Contribution: This study applies the Triple Bottom Line framework to Bali's mangrove ecotourism, providing insights for policymakers and practitioners to develop strategies that balance economic growth, social welfare, and environmental conservation.

Keywords: *Mangrove Ecotourism, Ngurah Rai Grand Forest Park (Tahura), Sustainable Tourism Strategies, Triple Bottom Line*

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1. Introduction

Sustainable development is a concept that began to develop after the Stockholm Declaration in 1972. The United Nations (UN) stated that sustainable development aims to meet current needs without reducing the ability of future generations to meet their needs. In line with this, sustainable development simply provides an understanding that development should be able to meet current needs without sacrificing the ability of future generations to meet their needs. Law No. 32 of 2009 concerning Environmental Protection and Management in Article 1, paragraph 3 explains that sustainable development is a conscious and planned effort that combines environmental, social, and economic aspects into a development strategy to ensure the integrity of the environment as well as the safety, capabilities, welfare, and quality of life of present and future generations.

Rapid population growth exerts significant pressure on land due to excessive use. This is inevitable and leads to land degradation when its use exceeds its capacity and natural carrying capacity (Widiatmaka, Ambarwulan, Purwanto, Setiawan, & Effendi, 2015). The utilization of natural resources in development processes is inherently linked to environmental considerations and spatial planning. Unfortunately, planning and sustainability in these areas have often been overlooked, leading to a decline in the quality and functionality of the environment and its natural resources. Environmental problems continue to increase, indicating that existing environmental policies have not been successful.

Ecotourism is a form of tourism that is ecologically based and environmentally friendly and can provide an alternative solution to land pressure. The main concern of ecotourism is not merely having fun or filling free time (leisure), but bringing tourists close to the natural environment, having knowledge, understanding, and a tendency to act (trend to action) in accordance with environmental rules. The basic principle of ecotourism is to harmonize environmental conservation, community development, and sustainable tourism activities so that everything can go hand in hand. Ecotourism offers various benefits from economic, environmental, and social perspectives (Sahatutua, Setiady, Astawa, & Ansari, 2025). Economically, ecotourism can create jobs, increase local community income, and reduce dependence on the mass tourism sector. From an environmental perspective, ecotourism contributes to the preservation of natural habitats and endangered species and reduces the negative impacts usually caused by conventional tourism. Socially, ecotourism can strengthen local communities, increase awareness of the importance of environmental conservation, and encourage community participation in managing natural resources (Putri, Yulianto, Wardani, & Saputro, 2022).

Bali is an island in Indonesia that has been recognized as one of the leading tourist destinations in the world. In 2019, Bali received an award as the best holiday location in the world from TripAdvisor. This island offers many attractive attractions for many people, including families and visitors who want to relax on white sandy beaches, such as in Kuta, Seminyak, and Jimbaran. Bali also provides a variety of recreational options for families, such as water parks and entertainment centers, as well as cultural attractions, including traditional dance and art performances. With its rich and comprehensive culture, Bali also displays stunning natural beauty. Tourists have the opportunity to experience traditional village life, visit amazing temples, and interact with friendly local residents (Dewi, N. D. U., Widanti, N. P. T., Sumada, I. M., & Widnyani, 2024).

The rapid development of the tourism sector in Bali as an international tourist destination known for its attractions, natural beauty, and cultural arts has given birth to a new paradigm among tourists. They are increasingly interested in tourism concepts that emphasize environmental conservation and returning to nature, often referred to as alternative tourism or ecotourism (Christiani & Adikampanan, 2014). This approach aims to encourage the development of tourism that is environmentally friendly, managed sustainably, and responsibly, so that it can provide greater benefits for the income and welfare of local communities.

One of Bali's most promising natural resources for supporting a nature-based tourism model is the Bali Mangrove Forest Area, which can seamlessly integrate conservation and sustainability values to deliver significant economic benefits and improve local community welfare (Fanggidae, Molidya, & Guterres, 2024). The Bali Mangrove Forest, also known as the Ngurah Rai Grand Forest Park (Tahura), is a

natural diamond hidden in the busy city of Denpasar. Located in Suwung Kauh, Jalan By Pass Ngurah Rai, this forest offers a unique experience through its natural beauty and ecological benefits to the community. With an area of 1,373 hectares, the Bali Mangrove Forest has a 2 kilometer long trekking path made of wood, allowing visitors to explore the mangrove forest without stepping on muddy ground.

The mangrove forest ecosystem is a coastal area with tourism potential (Fahrian et al., 2015). The unique mangrove ecosystem has the potential to be used as a natural resource for ecotourism (Arfan et al., 2017; Sartika et al., 2015; Suyanto et al., 2018). Utilizing mangrove forests for ecotourism is a rational choice in coastal areas because it provides economic benefits and environmental services without exploiting the mangrove resources (Karlina, 2015). This ecotourism activity combines tourism, conservation, and the empowerment of local communities (Saputra & Setiawan, 2014).

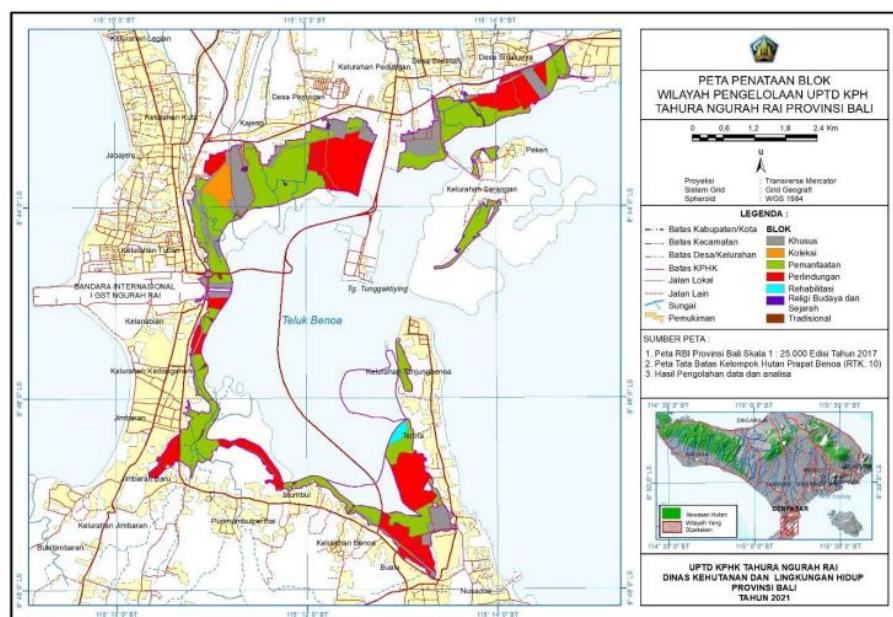


Figure 1. Map of the Bali Mangrove Area (Tahura Ngurah Rai)
Source: (Sutiarso, Suprpto, & Pantiyasa, 2023)

The triple bottom line (TBL) approach is highly relevant to ecotourism development in Bali. This approach assesses the success of an initiative based on three main dimensions: economic, environmental, and social dimensions. This research examines Bali's mangrove ecotourism through a triple bottom line approach, which assesses success based on three main dimensions: economic, environmental, and social. By analyzing this research through a triple bottom line lens, we can evaluate how ecotourism in Bali contributes to local economic growth, environmental preservation, and the social welfare of local communities.

2. Literature Review

Ecotourism, or sustainable tourism, emphasizes environmental conservation, local community empowerment, and economic sustainability. The Triple Bottom Line (TBL) approach, which includes people, planet, and profit, is often used to evaluate sustainability in the tourism sector. This study aims to assess sustainable tourism strategies from a TBL perspective in Bali's mangrove forest areas.

Several studies have explored the implementation of the TBL concept in ecotourism development in various countries. For example, Hidayat (2023) evaluated the application of TBL in the Takapala Malino Gowa Waterfall tourism area and found that this approach can improve community welfare, maintain environmental sustainability, and increase economic benefits. Similarly, research by Jauharie and Firdaus (2024) in Lumbung Stroberi, Kota Wisata Batu, showed that the application of TBL can improve tourism sustainability through social contributions and environmental preservation. In

addition, Meryawan et al. (2023) show that to strengthen sustainable tourism products, it is necessary to emphasize the Triple Bottom Line (TBL) principle by prioritizing benefits for fellow humans (people), preservation of natural tourist areas (planet), and improving community welfare (profit). Putra and Larasdiputra (2020) in their research at Pelaga Tourism Village, examined the Application of the Triple Bottom Line Concept in Tourism Villages which are dominated by agricultural areas. The results showed that the application of the Triple Bottom Line (TBL) Principle was successful. Wismaningtyas et al. (2022) examined the Triple Bottom Line Implementation in Sustainable Tourism for Perception Branding in Ngargogondo Tourism Village, Magelang, Indonesia. This study highlights the importance of implementing TBL principles to promote sustainable tourism in Ngargogondo Village, improve the welfare of local communities, protect the environment, and improve relationships between stakeholders.

Several studies have highlighted the importance of conservation-based ecotourism in mangrove forests. Hertati, D. (2020) stated that ecotourism in mangrove forests can synergize with real ecosystem conservation measures. In addition, Utomo and Pulungan (2023) revealed that the development of mangrove ecotourism can increase environmental awareness and provide economic benefits for local communities.

However, the implementation of TBL in mangrove ecotourism development faces challenges. Research by Jauharie and Firdaus (2024) at Lumbung Stroberi, Batu City, shows that although the profit and planet aspects have been well implemented, the people aspect has not been fully optimized. Research from Gatot Morwanto et al. (2023) examined the utilization of mangrove forests as mangrove ecotourism destinations in Kampung Tua Bakau Serip, Sambau Village, Nongsa District, Batam City. The results of the analysis show that mangrove forest ecotourism development has opportunities by utilizing strengths for ecotourism development in the Kampung Tua Bakau Serip area, which can create new jobs, especially in the field of tourism, particularly for local communities. In addition, Winarno and Sawarjuwono (2021) criticized the TBL concept. Their analysis shows that without a strong philosophical foundation, the implementation of TBL may not achieve the expected sustainable balance.

Although many studies have explored the implementation of TBL in ecotourism, there is still a gap in understanding how the three aspects of TBL can be effectively integrated into the development of mangrove forest ecotourism in Bali. Most studies tend to focus on one or two aspects of TBL, while the integration of all three aspects has not been widely researched yet. In addition, research on the role of local communities in mangrove ecotourism management from a TBL perspective remains limited.

Based on the results of the literature review analysis and identification of research gaps, the hypotheses of this study include examining the implementation of sustainable tourism strategies that integrate the three aspects of TBL (people, planet, and profit) in a balanced manner, which will increase the sustainability of mangrove forest ecotourism in Bali. The active participation of local communities in mangrove ecotourism management contributes significantly to the successful implementation of TBL and sustainable tourism. In addition, developing environmental education programs for tourists and local communities increases conservation awareness and supports the planetary aspect of the TBL. Collaboration between the government, local communities, and the private sector in mangrove ecotourism management will increase profit without sacrificing the people and planet aspects.

3. Research Methodology

This study is a literature review. Literature study method according to Zed (2008) in Ng, Tan, and Leung (2024) involves a range of activities including gathering data from libraries, reading, making notes, and arranging research materials. A literature study is an essential step in research, especially academic research, which aims to develop theoretical and practical aspects. Each researcher conducted literature studies to build a theoretical basis, framework for thinking, and establish research hypotheses. This process allows researchers to group, allocate, organize, and utilize various references in their fields. Through literature studies, researchers gain a deeper and broader understanding of the problem to be researched. In general, a literature study is a method for solving problems by exploring various previously existing written sources. In other words, the term literature study is also often known as a library study.

4. Results and Discussion

4.1 Mangrove Forest Area, Ngurah Rai Forest Park, Bali

The Results and Discussion section must include a logical and scientific analysis of the research findings. Present evidence shows that the country has the largest mangrove forest in the world, covering 3,112,989 hectares or approximately 22.6% of the total global mangrove area. This area far exceeds Australia (7.1%) and Brazil (7.0%) (Kganyago & Shikwambana, 2020) (Dewi & Maharani, 2022). Indonesia is home to at least 202 species of mangrove plants, including 89 tree species, five palm varieties, 19 climbers, 44 ground herbs, 44 epiphytes, and one fern species. Of these 202 species, 33 tree species and various shrubs are classified as true mangroves, while other species are located near mangroves and are called associated mangroves (Noor et al., 2006) in (Dewi, L. M. P. N., & Maharani, 2021).

Most mangrove forests in Bali Province grow in the Ngurah Rai Grand Forest Park (TAHURA). The Tahura Ngurah Rai Bali area is geographically located at 115°10'-115°15'E and 8°41'-8°47'S and administratively located in two regions, namely Badung Regency and Denpasar City (Partama, Wardhani, Surata, Yastika, & Kusuma, 2024). Based on the Decree of the Minister of Forestry of the Republic of Indonesia Number 885/Kpts-II/92, dated September 8, 1992, the status of the RTK 10 forest area was changed to the Prapat Benoa-Suwung Nature Tourism Park (TWA PBS). In 1993, through the Decree of the Minister of Forestry No.544/Kpts-II/1993, the Prapat Benoa Forest Group (RTK.10) was designated as the Ngurah Rai Grand Forest Park. The Grand Forest Park area covers 1,373.5 hectares, which offers charming natural views and is located in a very strategic location at the center of Bali's business and tourism growth (Dewi, N. D. U., Widanti, N. P. T., Sumada, I. M., & Widnyani, 2024).

In general, the configuration of this area is flat, influenced by tides (Ngaliman, Catrayasa, & Lie, 2024), with slopes that slope downward towards the east and a height of between 0-2 meters above sea level. Based on the geological map, this area is formed from alluvial sedimentary rocks with terrace rock types and coral reefs. The soil consists of alluvial hydromorphs and brown hydromorphs, which have poor drainage but are still productive. The Tahura area is inhabited by a variety of flora and fauna that provide benefits to human life and other ecosystem components. Many vegetation types, both mangrove and non-mangrove, grow around this area. There are 33 types of mangroves. This vegetation plays an important role in providing protection and as a source of food for aquatic and terrestrial animals. The fauna found here include various types of fish and birds associated with mangrove forests. According to a survey report on the use of the Prapat Benoa Bali forest area (1987), there are 14 types of fish that live in mangroves, including milkfish (*Chanos chanos*), snapper (*Lates carcarifer*), crab (*Lethinus aeratus*), and shrimp (*Leanus Sp.*). Various types of birds are also associated with mangrove forests in the Tahura area. These birds use mangrove forests to find food, rest, nest, and as a stopover for migratory birds (Sutiarso et al., 2023).

This coastal conservation center is managed by the Tahura Ngurah Rai Technical Implementation Unit and has been open to the public since 2010 (Given and Archibald, 2015) Given and Archibald (2015). This location can be visited every day from 08.00 WITA to 17.00 WITA by paying an entrance fee of IDR 10,000 per person. The management of Tahura Ngurah Rai offers educational tours and natural adventures to explore the conservation area. Visitors can walk on a wooden path 1.8 kilometers long and 2 meters wide, which is at a height of 2-3 meters above the water surface, dividing the Tahura area. This wooden walkway ends at a viewing tower approximately 20 m high.

4.2 The Concept of Ecotourism as Sustainable Tourism in the Tahura Ngurah Rai Mangrove Forest, Bali from a Triple Bottom Line Perspective

Over time, the definition of ecotourism has evolved through the contributions of various individuals and organizations in this field. According to the International Ecotourism Society (TIES), ecotourism is defined as responsible travel to natural areas that both conserves the environment and enhances the well-being of local communities. According to Minister of Home Affairs Regulation No. 33 (1999), ecotourism is a natural tourism activity carried out responsibly, paying attention to elements of

education, understanding, and supporting efforts to conserve natural resources, and increase the income of local communities.

The Triple Bottom Line (TBL) concept, introduced by John Elkington in 1997, emphasizes the importance of companies focusing not only on financial profits but also on community welfare and environmental sustainability. This approach aims to measure the total impact of company activities, including profitability, social contribution, and environmental protection (Wismaningtyas et al., 2022). Apart from Elkington, Andrew Savitz (2006) proposed a similar concept, emphasizing sustainability in organizational operations. Aulia and Kertawijaya (2013) in (Basar, Hamzah, & Aisyah, 2023) show that these three aspects of TBL are interrelated. From an economic perspective, companies need to pay attention to profits to remain sustainable. From a social perspective, companies must strive to have a positive impact on society. From an environmental perspective, company activities must align with environmental conservation. The Triple Bottom Line concept is an extension of the concept of sustainable development, which links the dimensions of goals and responsibilities to shareholders and stakeholders, including profit, people, and the planet (Hoque, Rahman, Molla, Noman, & Bhuiyan, 2018).

4.2.1 Profit

Profit is the main goal that companies must achieve as a form of responsibility. In mainstream economics, profit is considered the philosophical basis that regulates company operations (Endi, Fanggidae, & Ndoen, 2023). Therefore, achieving profits is a top priority for companies (Simanjuntak & Fatur Rahman, 2023). Profit emphasizes the economic benefits of businesses. The mangrove ecosystem plays a vital role in supporting the economic and social lives of communities in coastal areas, including the people of Bali Suwarsih (2018) in Mukasyaf et al. (2024). From a sectoral perspective, the diversity of resources in coastal areas makes a major contribution to the community's economy through various sectors such as fisheries, forestry, industry, tourism, mining, and others. Mangrove forests provide various high-value products from an economic perspective. The products produced include wood, food, materials for household needs, cosmetics, plant seeds, dyes, leather tanning materials, and animal and bee feed. These products play an important role in meeting community needs and supporting regional economies that rely on mangrove forests.

Management of the Tahura Ngurah Rai mangrove forest as a coastal area prioritizes achieving a balance between economic use and environmental preservation. As a place that prioritizes ecotourism, the Tahura Ngurah Rai mangrove forest, the surrounding community benefits economically. The presence of mangrove forests in this area has improved the welfare of the community, one of which is the Segara Guna Batu Lumbang Joint Business Group (KUB) in Bali. This group stated that the main commodity caught by fishermen was mud crabs. Their members' daily income from catching crabs can reach IDR 300 thousand. Through ecotourism, the income of the people around the Tahura Ngurah Rai mangrove in Bali, specifically for the people of the Suwung area, has become diverse. The opening of the mangrove area for ecotourism also presents job opportunities in the culinary sector, which combines the catch of local fishermen with restaurants with a mangrove forest atmosphere. Apart from that, with the concept of tourists being able to walk around the mangrove forest for 25-30 minutes, fishermen from the Segara Guna Batu Lumbang Fisherman Group can also rent out their boats at a cost of 25 thousand per person (Tourism, 2022).

4.2.2 People

People refer to the social environment in which a company operates. This includes individuals or groups that can influence or be influenced by the company (Syafri, Wibisono, & Nurhatisyah, 2024). Strong relationships between companies and society are important for creating value. The sustainability of a company's operations is highly dependent on support and good relations with the surrounding community (Ordonez-Ponce, Clarke, & MacDonald, 2021). Ngurah Rai Bali Forest Park Ecotourism, viewed from the perspective of people indicators, emphasizes preserving the Mangrove Forest area through community empowerment. This has a significant positive impact on the surrounding community. Ecotourism not only provides employment opportunities for local residents but also increases public awareness of the importance of environmental conservation. Research from Setiastri,

Windia, and Astarini (2019) by title *Perception and Behavior of Communities Around Mangrove Forests Regarding Mangrove Conservation in the Ngurah Rai Grand Forest Park Area*, Balistated that the level of perception of the community around mangroves regarding mangrove conservation in the Tahura Ngurah Rai Bali area is categorized as very good. This very good perception arises from the support of community character, including education level, livelihood, and upper-middle economic status. This positive perception is very helpful and makes it easier to implement programs or activities carried out by the government and its proponents from the community.

This perception is also accompanied by BPHM (Mangrove Forest Management Center) Region I Bali, which has implemented various programs to preserve the Tahura Ngurah Rai Mangrove. One significant contribution is the empowerment of local communities, including mangrove farmers directly involved in processing mangrove forest products. Local communities participate in routine activities such as exhibitions, expos, and various events at regional, national, and international levels. Previously, they had received special training to improve their skills in processing raw products into quality products that were attractive and worth selling.

In the people indicator, the welfare of the surrounding community through Ngurah Rai Forest Park ecotourism is implemented through collaboration among community groups. Segara Fishermen Use Batu Lumbang with PLN Indonesia Power. Collaboration in developing mangrove forests around power plants on the coast of Denpasar, Bali: This program can improve the quality of fresh water and prevent abrasion, especially for coastal communities, in line with the World Water Forum Summit (WWF Summit), as well as increase fishermen's catches and become a new income field for communities in the ecotourism sector.

4.2.3 Planets

Planet refers to the physical environment in which companies operate. The survival of a company depends greatly on the physical environment. The relationship between companies and nature is crucial because environmental damage and uncontrolled exploitation negatively impact companies and society. The Bali mangrove forest area, which is being developed into ecotourism, can certainly occur as a result of good environmental conservation of the mangrove forest area. Environmental preservation efforts carried out by the community, government, and private sector can positively impact various aspects. Ecotourism is an option for local governments to present a tourism concept without damaging the environment (Mukasyaf et al., 2024).

Mangrove Ecotourism has been a pioneer in efforts to preserve mangroves by implementing creative innovations, focusing on empowering fishermen who are active in caring for and preserving mangroves in the Tahura Ngurah Rai area. Although it functions as a conservation and tourism area, local communities face operational funding constraints in managing environmental conservation activities. In its management, the community collaborates with the Food Security and Fisheries Service and the Bali Provincial Environment Service through the Segara Guna Batu Lumbang Fishermen's Group and Batu Lumbang Minawerdi Supervisory Community Group (Mukasyaf et al., 2024). Mangrove forests have a multifunctional role and are a source of income for coastal village communities, as well as a habitat for various marine biota and coastal flora and fauna. Sugiyanti (2020) researched Sugiyanti (2020) Preserving the Mangrove Ecosystem in the Ngurah Rai Grand Forest Park (Tahura), Suwung Village, Denpasar, Bali. The community plays an important role in preserving the mangrove ecosystem. The results of his research show that the community is trying to preserve the mangrove ecosystem by maintaining cleanliness in the mangrove ecosystem area, actively participating in mangrove planting and nursery activities, and providing support and appreciation to NGOs and community groups working in the field of preserving the mangrove ecosystem. This shows that the community is aware of the importance of mangrove ecosystems in coastal areas.

5. Conclusion

Ecotourism in Ngurah Rai Forest Park is a clear example of applying the triple bottom line concept in sustainable development. By balancing three main aspects: economic, environmental, and social, ecotourism has succeeded in making a significant positive contribution. From an economic perspective,

ecotourism in Ngurah Rai Forest Park has succeeded in increasing local communities' income. Empowerment programs that involve communities in processing mangrove forest products create new jobs and business opportunities. Through exhibitions, expos, and various events, local products produced by the community have high selling value and good quality, thereby improving the economic welfare of the surrounding community. In the environmental aspect, ecotourism plays an important role in nature conservation. Mangrove conservation efforts carried out not only involve the community and are supported by various parties, such as the government and related agencies. Community involvement in caring for and protecting the environment shows that ecotourism can increase awareness and education about the importance of environmental conservation.

Socially, ecotourism in Ngurah Rai Forest Park strengthens the relationship between the community and its surrounding environment. Through training programs and direct involvement in ecotourism management, communities feel a sense of ownership and responsibility for their natural resources. Synergy between society, government, and local groups creates harmonious and empowered communities. From a triple bottom line perspective, ecotourism in Ngurah Rai Forest Park not only provides economic benefits and environmental preservation but also improves the community's social welfare. This success shows that ecotourism managed using triple bottom line principles can develop sustainably, provide long-term benefits for all parties involved, and become an example of ecotourism management in other areas.

5.1 Limitations and Future Research

This study is limited to a literature-based analysis, without primary data collection or direct field observations. It focuses on conceptual discussions of the Triple Bottom Line approach in ecotourism management without a detailed quantitative assessment of economic, social, and environmental impacts. Future research should incorporate empirical data, including surveys and case studies, to provide a more comprehensive evaluation of the effectiveness of sustainable tourism strategies in the mangrove forest area. Further studies should explore the long-term impact of ecotourism policies on local communities and environmental conservation efforts.

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