

# Collaborative Strategies for Managing Mangrove Ecotourism: Raising Awareness and Stakeholder Participation in Sustainable Tourism

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## ABSTRACT

*The purpose of this research is to identify and develop collaborative strategies in managing mangrove ecotourism with a focus on increasing awareness and stakeholder participation in sustainable tourism. This research aims to explore ways to increase community awareness and stakeholder involvement in sustainable mangrove ecotourism management efforts. This research uses a qualitative approach with an explanatory case study method, because this research investigates and describes the complexity in the context of stakeholder involvement in the development of edu-ecotourism in Lembur Mangrove Patikang, Pandeglang. Data collection techniques used in-depth interviews, document study and observation. Data collection techniques used in-depth interviews, document study and observation. The Edu-Ecotourism Mangrove program in Patikang Mangrove Valley, run by PT Chandra Asri Petrochemical Tbk, is a sustainable initiative involving various stakeholders, including companies, governments, academic institutions, media, and local communities. The program aims to integrate education, environmental conservation, and sustainable tourism in mangrove forest preservation, building environmental awareness, increasing stakeholder participation, and empowering local communities in ecotourism management. It emphasizes economic, social, and environmental sustainability, demonstrating a commitment to holistic engagement. This study has several limitations of results due an interpretation, and limited stakeholder engagement. future research can improve the validity, reliability, and relevance of the recommendations.*

**Keyword:** Edu-Ecotourism, Stakeholder, engagement, Awareness

## INTRODUCTION

Mangrove ecotourism is the sustainable tourist idea that incorporates environmental education, community engagement, nature protection, and local economic growth. These actions raise visitor knowledge, instill a sense of ownership and responsibility for environmental conservation, and benefit the local economy. The emphasis on environmental protection and sustainability in ecotourism activities helps to conserve the environment while also improving the welfare of the local community (Yaeni et al., 2022). One such example is the ecotourism

mangrove in the Banten region. Mangrove ecotourism is an essential asset in the development of tourism in Banten Province. Mangrove forests are widely found throughout in coastal areas, where tidal flows inundate these ecosystems. The function of mangrove ecosystems as ecotourism destinations is a viable option for coastal communities (Gias et al., 2023). Banten's mangrove forests are vital for biodiversity conservation, erosion control, and habitat for a variety of species. Although smaller than other locations, Banten's mangrove forests contribute significantly to ecology. Monitoring, preserving, and protecting these ecosystems is critical for their long-term existence and benefits to both humans and the environment (Asy'Ari et al., 2022).

Mangrove forests have become increasingly popular tourist destinations due to their unique biological features and possibilities for ecotourism activities. However, the growth of mangrove ecotourism might create complicated issues in terms of environmental protection and the interests of diverse stakeholders. A key challenge is the delicate and dynamic character of mangrove ecosystems. Mangrove forests are extremely vulnerable to disturbances and can be quickly harmed by unregulated tourism activity (Manan, 2020). According to (Hamimah et al., 2022) urban development, aquaculture, and fisheries exploitation all pose concerns to mangrove forests' potential to operate as a sustainable tourism attraction. Conservation activities are consequently critical for ensuring the long-term health of these ecosystems. Another essential consideration is balancing the interests of many parties. Local communities, government agencies, commercial enterprises, and environmental groups can all participate in mangrove ecotourism initiatives, each with its own set of goals and viewpoints (Kurniawan et al., 2020). To build ecotourism programs that meet both environmental sustainability and the economic and social requirements of the local community, effective collaboration and communication between these groups are required (Abdillah et al., 2020).

One of the mangrove ecotourism regions that is becoming a viable tourist destination is starch mangrove lembur edu-ecotourism. Lembur Mangrove Patikang is a unique tourist area in Patikang Village, Citeureup Village, Panimbang Sub-district, Pandeglang Regency, Banten. It offers a sustainable mangrove ecosystem, allowing visitors to explore the unspoiled forest and learn about the diverse flora and fauna. Educational programs raise awareness about the importance of preserving mangroves for the environment (Jadesta Kemenparekraf, 2024). The area also offers various activities, such as trekking, boating, fishing, and taking pictures. Lembur Mangrove Patikang aims to become the leading educational and ecological tourist destination in Indonesia, promoting sustainable tourism and positive impacts on the environment and society (Susmiatun Hayati, 2022).

In addition, patikang mangrove lembur is a program that is still developing and is part of the sustainability program carried out by PT Chandra Asri Petrochemical Tbk in collaboration with Pokdarwis Putri Gundul Citeureup and IKAMAT as NGO and consultan (PT Chandra Asri Petrochemical Tbk, 2022b). The edu-ecotourism program Lembur Mangrove Patikang, designed by PT Chandra Asri Petrochemical Tbk, clearly incorporates ESG (Environmental, Social, Governance) aspects (Antara News, 2024). ESG integration in the program entails a variety of activities, including the use of non-B3 waste for infrastructure renovation, waste management to reduce factory waste, mangrove conservation efforts to increase carbon sequestration, and local community empowerment and stakeholder participation in decision making (PT Chandra Asri Petrochemical Tbk, 2022a). Furthermore, the program demonstrates the integration of ESG with effective business sustainability practices and raising awareness about ESG (Hoang, 2018).

Stakeholder participation is the main key to ensure the sustainability of the program (Seva et al., 2022). Amoako et al., (2022) discovered that stakeholder engagement in sustainable tourism management is critical to developing sustainable practices. Understanding sustainability concerns among management, local communities, and government promotes active involvement and new ideas, aligning activities with long-term environmental, social, and economic objectives, and resulting in sustainable outcomes for destinations and communities. Yasir et al., (2021) explained that with pentahelix communication, the collaboration among the government, local communities, industry, educational institutions, and the media is critical to the sustainability of tourism. Stakeholder participation in resource management, conservation activities, and tourist infrastructure development guarantees long-term benefits while also conserving local culture. Jun & Kim, (2021) has developed critical methods to improve stakeholder communication and

participation. Conducting materiality evaluations to identify key sustainability challenges. then, Analyzing global sustainability activities to ensure compliance with industry best standards. Conducting regular surveys of experts to gather opinion on sustainability goals. Identifying and ranking stakeholders according to their relevance and interests. Using the SDGs as indicators of sustainable management to connect with global goals.

Stakeholder involvement in attaining the SDGs may be done through multi-stakeholder cooperation, which includes several aspects such as deep understanding, active collaboration, transparency and communication, performance assessment and evaluation, and long-term dedication. This collaborative approach to stakeholder participation can help achieve common goals more effectively and sustainably (Wulan Dari & Nur Fitriana, 2024). Irawan et al., (2022) mentioned that stakeholders' roles may be formed through voluntary collaboration and mutually beneficial involvement, in which both parties gain from the cooperation program's execution. Measuring stakeholders' capacity to form a network of collaboration can help to assess the performance of sustainable tourism management. Stakeholder participation is required in order to build strategic plans, conduct decision-making, and contribute to sustainable tourism management and development (Roxas et al., 2020; Wu et al., 2023).

The function of awareness in stakeholder engagement has received substantial attention in recent years, as companies acknowledge the crucial relevance of successful communication and collaboration with varied stakeholder groups (Alqaisi, 2018). Communication strategies to enhanced awareness are essential for stakeholder involvement in environmental management and sustainable tourist development (Irawan et al., 2022). This can be accomplished through frequent updates, meetings, or alternative channels for two-way communication and feedback. Stakeholders are more likely to feel invested in the program's success and involved in decision-making when communication is timely and honest (Mok & Shen, 2017). Raising awareness also important for mitigating mangrove degradation through ecotourism (Yasir et al., 2021). High levels of awareness will aid in the development of common understanding, increase communication and collaboration, and provide a supportive atmosphere for achieving shared sustainability goals (Raji & Hassan, 2021). With dialogue and collaboration enhance mutual understanding, learning, education, and awareness, also frequently viewed as a means for organizations to interact in the context of contentious issues (Golob & Podnar, 2014; Papagiannakis et al., 2019).

The impact of awareness-raising programs on stakeholder collaboration is assessed, as well as the efficacy of communication strategies. It suggests that understanding these factors can assist policymakers, tourism operators, and other stakeholders in developing targeted awareness campaigns and communication strategies for sustainable tourism programs, fostering shared responsibility and commitment, and ultimately leading to a more collaborative and sustainable approach to tourism development (Baig et al., 2020). Effective stakeholder communication refers to a clear articulation of the organization's purpose, values, and strategies, with the goal of fostering a common understanding and commitment to the company's mission. Rather than viewing stakeholder engagement as a one-way transmission of information from the organization to its stakeholders, this approach recognizes the importance of an interactive, collaborative process in which stakeholders actively participate in dialogue, collective problem-solving, and value co-creation (Leonidou et al., 2020).

Based on the articles mentioned above investigates on mangrove ecotourism management concerns, such as change risk and stakeholder participation. Strategies for increasing stakeholder participation include development programs that raise knowledge of mangrove preservation and variety, as well as sustainability problems including climate change, carbon emissions, waste management, and others. The purpose of this research is to identify and develop collaborative strategies in managing mangrove ecotourism with a focus on increasing awareness and stakeholder participation in sustainable tourism. This research aims to explore ways to increase community awareness and stakeholder involvement in sustainable mangrove ecotourism management efforts.

## RESEARCH METHODS

The purpose of this research is to identify and develop collaborative strategies in managing mangrove ecotourism with a focus on increasing awareness and stakeholder participation in sustainable tourism. This research aims to explore ways to increase community awareness and stakeholder involvement in sustainable mangrove ecotourism management efforts. This research uses a qualitative approach with an explanatory case study method, because this research investigates and describes the complexity in the context of raising awareness and stakeholder involvement in the development of edu-ecotourism in Lembur Mangrove Patikang, Pandeglang. Data collection techniques used in-depth interviews, document study and observation. This research incorporates local knowledge and stakeholder communication, which focuses on sustainable tourism development, so the researcher uses a single case approach (embedded) and matches the research pattern.

Key informants are research participants who are deeply familiar or have some unique interest regarding the studied issue. This may include reaching out to members of the community or field of interest who are knowledgeable and possess experiences they encourage to share (Cresswell et al, 2018). The criteria for informants in this study are as follows: 1) The originator of the idea of the edu-ecotourism development program of patikang mangrove lembur, pandeglang; 2) Informants who are directly involved in the edu-ecotourism development program of patikang mangrove lembur, pandeglang; 3) Informants who hold the responsibility of each communication strategy planning in the edu-ecotourism development program of patikang mangrove lembur, pandeglang. Therefore, the resource persons chosen were representatives are: 1) Wawan Mulyawan as Community Share Value Manager; 2) Gita Permata Aryati as Community Development Officer; 3) Rivaldi Madyatama as ESG Practitioner Officer. They are act as key informants from PT Chandra Asri Petrochemical Tbk who also served as the corporate PIC for the Patikang mangrove Patikang program. Then, Deden Sudiana as the Head of Pokdarwis as the PIC of Patikang mangrove Patikang, Paspha Gaishidra Muhammad Putra from IKAMAT as the program planning consultant and contribute in mangrove Patikang development. And the last, researcher acts directly in this research as main tool to obtain information, interpreting, and analyzing to understand the phenomenon under study.

## RESULT AND DISCUSSION

The establishment of edu-ecotourism in Patikang Mangrove Lembur is one of PT Chandra Asri Petrochemical TBK's outstanding programs. The program is a sustainability program that incorporates ESG factors. Lembur Mangrove Patikang Edu-Ecotourism Edu-Ecotourism Development Program, which is operated by PT Chandra Asri Petrochemical Tbk, covers 3 hectares in Citereup Village, Panimbang District, Pandeglang Regency, Banten Province. This development initiative encourages various stakeholders, like the Putri Gunung Citeureup Tourism Awareness Group (Pokdarwis), to collaborate in developing and preserving the region as a research, mangrove conservation, and tourism destination. The Patikang Mangrove Area serves as a buffer zone for Tanjung Lesung Special Economic Zone (KEK) in Pandeglang.

The location promotes sustainable tourism via education and ecotourism. The initiative has several facets, including environmental, social, and economic. One of the primary goals is to conserve mangrove forests in order to boost carbon sequestration, minimize tidal floods, and promote biological value. In addition, the initiative encourages community engagement through mentorship and training programs. Lembur Patikang has the potential to become both a natural arboretum for mangrove species and a popular tourist destination. This development scheme is based on PROPER regulations issued by the Ministry of Environment and Forestry.

Mangrove edu-tourism should be developed in order to promote sustainable tourism through knowledge about the environment, community engagement, ecological protection, and local economic growth, as well as to build environmental awareness, promote responsibility, and improve community welfare (Yaeni et al., 2022). The Patikang Mangrove Lembur Edu-Ecotourism Program is one of the company's strategies for raising awareness about sustainability concerns, particularly environmental issues such as environmental protection, community engagement, and local economic growth. In related to this, the corporation is bringing together several of

stakeholders, including Pokdarwis as PIC in Patikang, IKAMAT as a consultant in this initiative, and coastal communities, to establish groups to build and develop mangrove forests for ecotourism. The government is also participating in this issue, providing rules, policies, infrastructure, and assistance to ensure the long-term viability of Lembur Mangrove Patikang Edu-Ecotourism Development Program. Principally, Capacity building and empowerment of community-based groups may promote a sense of stewardship and ownership of mangrove assets (Yaeni et al., 2022).

### **Stakeholder Participation In The Establishment Lembur Mangrove Patikang Edu-Ecotourism**

Stakeholder involvement is critical for any firm looking to foster innovation. It gives essential feedback, information, possibilities, and ideas to help with new product development and market entrance. Engaging stakeholders also assists in identifying strategic opportunities and market segments. Furthermore, it enables the organization to pool resources to achieve common goals that would be hard or impracticable for one party to pursue on its own (Gutterman, 2023). The findings is PT Chandra Asri Petrochemical Tbk uses the Penta Helix approach to identify stakeholders in Lembur Mangrove Patikang Edu-Ecotourism edu-tourism development programme. This approach includes academics, business, government, media, and community, aiming to maximize participation and collaboration. The company also uses why-why analysis to identify potential conflicts among stakeholders, identifying the core cause of problems and facilitating effective resolution solutions. This approach helps in identifying sensitive areas of disagreement, forming communication plans, and improving the project's overall performance. The organization engages with a variety of internal and external stakeholders to understand their expectations, requirements, and concerns about sustainability challenges. Through dialogue and engagement with stakeholders, the organization may obtain a deeper knowledge of their viewpoints and ensure that its choices and actions align with the interests of all parties concerned.

Lembur Mangrove Patikang Edu-Ecotourism is a joint pursuit that includes a variety of collaborators. Universities contribute by conducting research, education, and training, which improves understanding of the area's ecological and educational potential. Private sector firms, such as PT Chandra Asri Petrochemical Tbk, give financial assistance and resources while adhering to ESG principles and mapping MSME potential. Governments, including village, district, and provincial governments, offer policy support and promote the initiative. The media spreads knowledge about the initiative and its conservation aims. Local communities, such as Pokdarwis, IKAMAT, and BUMDES, implement and monitor the program, which helps to manage and develop MSMEs on a daily basis, eventually benefiting the local economy. In this case, A value-oriented stakeholder engagement approach can help facilitate the co-creation of value and the development of shared ownership and commitment among stakeholders (Mok & Shen, 2017).

The Penta Helix communication model is a collaborative framework involving five key stakeholders: academia, business, community, government, and media. It aims to increase stakeholder engagement, foster innovation, and improve sustainability. Each stakeholder brings unique expertise, resources, and perspectives, creating a powerful force for positive change. The model encourages effective problem-solving, encourages innovation, and ensures initiatives are sustainable and aligned with community goals. The benefits of the Penta Helix model include increased engagement, improved innovation, and improved sustainability (Rosilawati et al., 2023).

There are various methods of stakeholder involvement from each stakeholder category. The Patikang mangrove edu-tourism development program has the following methods of involvement:

**Figure 1 stakeholder engagement and communication**

<i>Stakeholder Participation</i>	<i>Areas of Interest</i>	<i>Approach</i>	<i>Uses Communication Channel</i>
<b>Local Community</b>	Regulation and Support for Tourism Development	Community development / community awareness	Face to face, FGD
<b>Organization, Universities &amp; Government</b>	Develops and monitors the execution of actions that are consistent with sustainable development concepts.	information dissemination and provision, collaboration	Face to face, Two-way communication community forum, FGD
<b>Professional Association</b>	Stakeholders who may be part of the destination and be influenced by the tourist activity.	Cooperation agreements, meetings, Collaborate	Face to face, Two-way
<b>Media</b>	Media will disseminate the message about sustainable tourist destinations.	press release, public exposure (Inform)	Information Sharing
<b>Society</b>	Support for the existence of sustainable tourism destinations.	Media (Inform)	Media

Through collaboration between universities, government, communities, industry and mass media, information can be exchanged in an open and transparent manner. Regular meetings, discussion forums and open consultations allow each party to express their views and input. With effective information exchange, stakeholders can learn from each other, share resources and work together on joint projects to achieve common goals. Education and training programs that involve all parties can also improve understanding of tourism sustainability. The use of mass media and social media as a means to promote stakeholder involvement and participation is also an important strategy in improving stakeholder engagement. Thus, the integration of communication not only strengthens the relationship between them, but also ensures that all parties are actively involved in the efforts towards sustainable tourism (Yasir, Firzal, et al., 2021).

### **Collaborative Strategies through raising awareness and stakeholder engagement**

According to conversations with corporate employees, the company's vision is strongly focused on increasing environmental quality. Because of the mangroves' poor health, the Patikang region was frequently subjected to tidal floods. Through its activities, the corporation attempted to promote community awareness and enhance the environmental condition of the region in conjunction with the community. The good result of these initiatives may be observed in the lowered degree of tidal flooding, which still happens but is manageable by the local people. In addition to concentrating on environmental issues, the firm hopes to increase community welfare and establish Patikang's Lembur Mangrove edu-ecotourism as an introduction center for mangrove edu-ecotourism in Banten Province. To achieve these goals, the organization highlights the necessity of boosting the region's economy by raising climate awareness, protecting mangroves, and encouraging community engagement in using mangrove potential. The company's goal also emphasizes environmental factors, including carbon capture, by understanding the value of mangrove blue carbon and biodiversity conservation. The company's efforts to integrate environmental, economic, and social issues into mangrove management demonstrate its dedication to creating overall good outcomes for the environment and local residents. Another potential advantage of Lembur Mangrove Patikang is the economic benefit that tourism may provide to the local population. Pokdarwis also said that sections of the mangrove may be converted into food and drinks, providing an extra source of revenue for the community.

**Figure 2 The visual of Lembur Mangrove Patikang Edu-Ecotourism**

To promote sustainable tourism development, strategies include educational programs, community engagement, effective communication campaigns, partnerships, incentives, capacity building, and feedback mechanisms. These methods help raise awareness, encourage active participation, and foster commitment to sustainable practices. By implementing these strategies, stakeholders can be more effectively engaged and contribute to the success of sustainable tourism initiatives (Prayudi, 2018). PT Chandra Asri Petrochemical Tbk and IKAMAT have formed many partnerships to enhance mangrove protection and sustainable tourism. Lembur Mangrove Patikang Edu-Ecotourism Development Program educates and trains the local population in mangrove conservation and sustainable tourist practices. The program seeks to improve the community's knowledge and abilities in managing the mangrove environment. Furthermore, the relationship involves an MSME development initiative in the local community, with IKAMAT serving as a planning consultant to help construct MSMEs from within the neighborhood. These projects attempt to promote economic wellbeing while also maintaining the mangrove ecosystem's equilibrium. The Awareness Campaign developed by PT Chandra Asri Petrochemical Tbk and IKAMAT aims to increase community understanding of the ecological and socio-economic benefits of mangrove conservation. In this campaign, various communication channels are utilized, including social media, community meetings, and educational materials, to disseminate information and interact directly with local communities.

PT Chandra Asri Petrochemical Tbk and IKAMAT uses various communication channels, such as Facebook, Instagram, Twitter, and LinkedIn, to raise awareness about the benefits of mangrove conservation and the company's sustainable programs. Pokdarwis also uses communication channels such social media and websites to promote and raise awareness. The uses social media to reach a larger audience and communicate directly with communities. In addition, community meetings will be held in key sites to discuss, offer information, and solicit feedback from local people on mangrove conservation activities. PT Chandra Asri Petrochemical Tbk has taken proactive steps in spreading awareness about the importance of mangrove conservation to the community. They emphasize that maintaining mangrove ecosystems is an integral part of environmental conservation and sustainability efforts. Through this campaign, they not only educate about the important role of mangroves in maintaining biodiversity and protecting beaches from abrasion, but also inform about the resulting ecological and socio-economic benefits. the company also encourages active participation of the community in mangrove conservation efforts, and invites them to collaborate in environmental conservation programs. In addition, the company also campaigns for messages on decarbonization and community involvement in sustainable development. They emphasize the importance of collaboration between various parties to create a positive impact on the environment and society as a whole. In this way, the corporate seeks to build community awareness on important aspects of sustainability, including through economic empowerment of local communities, as part of their commitment to the environment and sustainable development. The result emphasizes the importance of communication in sustainable tourism, highlighting the role of dialogue, communication tools, coordinated planning, social media, and effective cooperation among stakeholders for sustainable development (Praničević & Peterlin, 2015).

Community engagement refers to the process of actively involving local residents and stakeholders in decision-making processes and activities related to a particular initiative or project. Community participation fosters a sense of ownership among locals, which can lead to

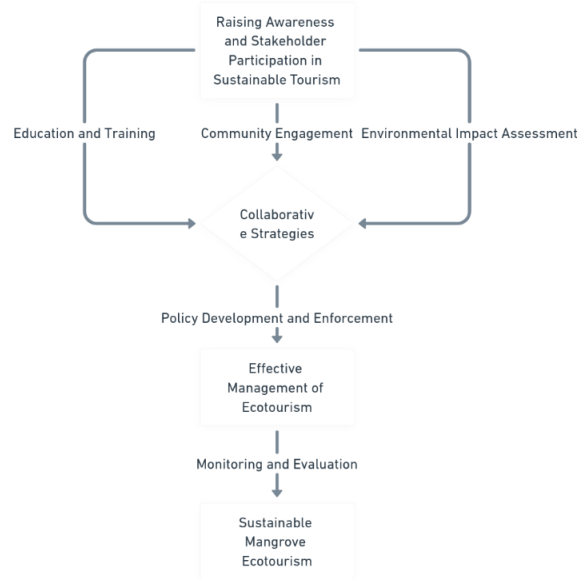
improved knowledge and protection for mangrove resources. This sense of ownership is critical to the long-term effectiveness of conservation initiatives (Sathiyamoorthy & Sakurai, 2024). PT Chandra Asri Petrochemical Tbk and IKAMAT's efforts towards mangrove conservation and sustainable tourism development, community engagement played a crucial role. This involved various activities such as community dialogues, focus group discussions, and participatory workshops where local residents were given the opportunity to voice their opinions, contribute ideas, and participate in shaping the conservation and tourism development plans. By engaging the community in these activities, the aim was to foster a sense of ownership, responsibility, and empowerment among the local population towards the conservation of mangrove ecosystems. This approach not only ensures that the initiatives are more inclusive and reflective of local needs and aspirations but also builds stronger relationships and partnerships with the community.

Capacity building initiatives are aimed at empowering individuals and communities with the knowledge, skills, and resources necessary to actively participate in and contribute to specific activities or projects (Sathiyamoorthy & Sakurai, 2024). In the case of PT Chandra Asri Petrochemical Tbk and IKAMAT's collaboration, capacity building focused on equipping local communities with the necessary tools to engage in mangrove conservation and sustainable tourism practices effectively. This involved conducting training programs, skill development workshops, and educational sessions to enhance the capacity of community members. By providing education and training opportunities, the goal was to enable community members to take on active roles in preserving mangrove habitats, implementing sustainable tourism practices, and contributing positively to the overall conservation efforts. Monitoring and evaluation are essential components of any collaborative initiative to assess the effectiveness, progress, and impact of the activities undertaken. In the case of PT Chandra Asri Petrochemical Tbk and IKAMAT's collaborative strategies, mechanisms for monitoring and evaluating the awareness-raising initiatives were put in place. This included conducting regular feedback sessions, surveys, and impact assessments to gauge the level of awareness and engagement among the local community. By continuously monitoring and evaluating the outcomes of their efforts, the organizations could gather valuable insights, measure the success of their awareness-raising campaigns, and identify areas for improvement. This iterative process allows for the adaptation of strategies and communication approaches to ensure maximum impact and sustainability of the initiatives over time.

For monitoring and evaluation, Social Return on Investment (SROI) is a method used to evaluate the social impact of an investment or program by comparing the social values generated to the costs incurred, and also can be a valuable tool for assessing the efficacy of stakeholder engagement and awareness campaigns in the context of communication research. Organizations may use SROI to measure the social effect of their work and find areas for improvement, resulting in better communication strategies and social sustainability results (Vluggen et al., 2020). that result from a particular investment or program. For example, in Lembut Mangrove Patikang Edu-Ecotourism edu-tourism development program, SROI is used to assess the social benefits of investments in mangrove conservation efforts and sustainable tourism development. This helps companies understand and measure the positive impacts of social investments, contributing to sustainable and social value-oriented decision-making. PT Chandra Asri Petrochemical Tbk employs the Social Return on project (SROI) technique in Lembut Mangrove Patikang Edu-Ecotourism edu-tourism development initiative to assess the social benefits of the project. SROI allows the firm to assess the program's social effect, such as increasing local community welfare, preserving the environment, and promoting economic empowerment.

During its execution, the business performed an SROI value evaluation especially for Lembut Mangrove Patikang Edu-Ecotourism edu-tourism development initiative. This is handled by the company's Corporate Social Value (CSV) section. This SROI measuring technique comprises examining the social benefits of expenditures such as human resource development, training, certification, and community empowerment. It also employs SROI to evaluate the return on social investments and to assess community satisfaction with the initiatives that have been implemented. Using this SROI technique, the organization may better comprehend the social values provided by Lembut Mangrove Patikang Edu-Ecotourism edu-tourism development projects, as well as identify the beneficial consequences of the investments.



**Figure 3 Collaborative Strategies Framework**

The findings of this study are consistent with ideas such as sustainable development and stakeholder engagement in mangrove ecotourism development. This study emphasizes the relevance of mangrove ecotourism development as a tool for promoting sustainable development. This study, through the Patikang Mangrove Soft Edu-Ecotourism initiative, highlights the importance of environmental conservation, local community engagement, local economic growth, and environmental awareness as components of a sustainable development plan. Furthermore, this study emphasizes the necessity of stakeholder engagement in mangrove ecotourism development. Lembur Mangrove Patikang Edu-Ecotourism Development Program employs the Penta Helix strategy to increase stakeholder engagement and collaboration by incorporating a variety of stakeholders including businesses, the government, academic institutions, the media, and local community.

Pokdarwis, IKAMAT, and BUMDES have participated in program implementation and monitoring, demonstrating the value of direct community participation in mangrove ecotourism management and development. This aligns with the notion of sustainable development, which emphasizes the importance of community engagement in environmental decision-making. Thus, the findings of this study lend strong support to the concepts of sustainable development, stakeholder participation, and local community involvement in the context of mangrove ecotourism development, all of which are critical steps toward achieving the goals of sustainable development and environmental conservation.

## CONCLUSION

The results of this study illustrate that the concept of effective stakeholder participation in mangrove ecotourism development has high relevance and has been proven successful in the implementation of Lembur Mangrove Patikang Edu-Ecotourism Development Program. By involving various parties such as companies, government, academic institutions, media, and local communities, this program successfully applies the Penta Helix approach which involves five main parties. The holistic and sustainable collaboration between academia, business, government, media, and communities has created an effective working environment. In Lembur Mangrove Patikang Pandeglang, the collaboration of stakeholder with Penta Helix approach has respective role. Such as the Pandeglang District to Banten Provincial Government takes responsible to regulation and policies related to tourism development, support facilities and promotion. They are also involved in decision-making and ensuring implementation in accordance with regulations and sustainable development goals.

In Private Sector, PT Chandra Asri Petrochemical Tbk plays an important role to providing financial support and resources, as well as applying ESG principles in the development of edu-ecotourism. They also conducted an economic evaluation and mapping of MSME potential. Furthermore, academics contribute through research, education and training. They help improve understanding of the ecological and educational potential of Lembur Mangrove Patikang, as well as share knowledge on conservation and natural resource management. The community plays a role as implementer, coordinator, and monitor of the program. They also contribute to the daily management and development of MSMEs that can improve the economy of the local community. In this case, BUMDES, IKAMAT, and POKDARWIS are involved in the development of the program. Last, The mass media plays a role in providing exposure and information to the wider community about the edu-ecotourism program, conservation goals, and activities carried out at Lembur Mangrove Patikang.

The penta helix stakeholders are all involved in the development of edu-ecotourism of patikang pandeglang mangrove lembur. with programs such as infrastructural programs, training on the utilization of mangroves both wood and non-wood that will be produced into souvenirs of the tour, the establishment of community-based groups, and certification of BNSP-based tour guides. with this program, strategic collaboration is created through penta helix collaboration.

Through the active involvement of various related parties, the program is able to utilize diverse expertise and resources to achieve the goal of sustainable mangrove ecotourism development. Thus, the results of this study provide concrete evidence that an inclusive and collaborative stakeholder participation approach can be a strong foundation in achieving the success of mangrove ecotourism development programs. Collaboration between various sectors is the main key in creating an effective and sustainable cooperation environment in mangrove ecotourism development.

The study underlines the significance of Penta Helix-based stakeholder engagement in mangrove ecotourism development, which includes academics, business, government, the media, and the community. It underlines the importance of cross-sector cooperation and good communication in raising environmental consciousness. The paper recommends that future research focus on comparing studies, quantifying effect assessments, and anticipating future trends in mangrove ecotourism growth. Community engagement in design, execution, and assessment can help to ensure ecotourism initiatives' long-term viability and widespread acceptability. These recommendations have the potential to make a substantial contribution to sustainable mangrove ecotourism.

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