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CSR STRATEGY: IFAS AND EFAS ANALYSIS OF BATU LUMBANG MANGROVE ECOTOURISM PROGRAM IN NGURAH RAI GRAND FOREST PARK

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ABSTRACT:

Batu Lumbang Mangrove Ecotourism Program is a corporate social responsibility (CSR) program in empowering fishermen households, developed by PLN Indonesia Power UBP Bali Company. This program was carried out in line with the condition of the Ngurah Rai Grand Forest Park as mangrove conservation area covering an area of 1,373.5 hectares on the South Coast of Denpasar City which faced the problem of potential damage due to waste with a quantity of up to 1.9 tons of garbage in the waste collection event in 2019. This study aims to examine the development strategy of Batu Lumbang Mangrove Ecotourism in Pemogan village, South Coast of Denpasar City. The study method using descriptive qualitative research conducted to analyze program development strategies concerning SWOT (strengths, Weaknesses, Opportunities, and Threats) analysis with Internal Factors Analysis (IFAS) and External Factors Analysis (EFAS) approaches. The results showed that the strengths possessed in the development of Batu Lumbang mangrove ecotourism lie in the strategy of aligning conservation activities and ecosystem utilization. Meanwhile, challenges were found in the form of waste management and infrastructure. The development of community-based mangrove ecotourism can be an effective sustainable development model, by combining environmental conservation, local economic improvement, and community education.

Keywords: *Ecotourism, Fisherman Empowerment, Corporate Social Responsibility, Program Development Strategy, Community Development*

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1. INTRODUCTION

The presence of mangroves is crucial for coastal ecosystems, as they provide ecosystem services that serve ecological functions, such as natural protection from storms (Bastien-Olvera et al., 2024) and support for biodiversity (Khalasi et al., 2025). They also offer economic benefits, including ecotourism potential (Elida et al., 2025) and carbon sequestration (Jahan & Sujarajini, 2024), as well as socio-cultural functions, such as providing resources to sustain the activities of local communities (Dasat, 2024; Faridah-Hanum et al., 2014). With their unique ecosystem, mangroves have the potential to be developed as tourist destinations. This activity aims to align mangrove conservation goals with the improvement of local community welfare (Bonde et al., 2024; Novita & Mukhtar, 2024). Therefore, the development of mangrove ecotourism represents a breakthrough in sustainable development efforts (Titisari et al., 2022).

Sabir (2020) identified that the mangrove ecotourism development strategy in Tongke-Tongke, and Mulyadi et al. (2021) for the Bandar Bakau mangrove ecotourism in Dumai, includes the provision of facilities, development of tourism products, strengthening the role of stakeholders, and environmental conservation and mitigation. This strategy emphasizes the active role of the community and local government, as well as the involvement of educational institutions in mangrove planting activities and financial support from corporations

for tourism facilities. In implementing ecotourism development strategies, the engagement of the community and stakeholders is paramount. A community-based approach is also implemented in the Kampung Baru mangrove area, involving the community in management and tourism promotion, providing economic and conservation benefits, and tourism education, including the creation of processed mangrove products (Risky, 2022). Potential ecotourism areas can also be enhanced through the creation of economic opportunities from handicraft production and improved tourism promotion, including through website platforms (Mulyadi, 2021). Furthermore, the development strategy for the Mangrove Ecotourism Area in Tabilaa Village is carried out by integrating several tourist attractions within a single tourism itinerary. This strategy is part of the importance of considering amenity aspects, including the management of facilities and infrastructure as well as services, the development of public facilities, and fostering partnerships with relevant stakeholders for the development and marketing of the ecotourism area (Makalalag et al., 2022).

The Batu Lumbang Mangrove Ecotourism Program, implemented by PLN Indonesia Power UBP Bali Company, serves as an empowerment initiative for fishers and their families. It aims to address the vulnerabilities faced by the fishing community and the issue of waste accumulation that threatens the sustainability of the 101-hectare mangrove forest within the Ngurah Rai Grand Forest Park know as Tahura (*Taman Hutan Raya*) Ngurah Rai Mangrove Conservation Area. As stated by Wahyono (2016), mangrove forests play a central role in storing fishery resources, mitigating natural disasters, and controlling climate change, thus being intrinsically linked to the daily lives of fishers. Furthermore, climate change exacerbates the uncertainties in fishers' livelihoods, as their fishing enterprises are highly dependent on seasons, prices, and market conditions. Initiated in 2020, the Batu Lumbang Mangrove Ecotourism Program was a response to the increasing degradation of the Tahura Ngurah Rai Mangrove Conservation Area (1,373.5 ha) in South Denpasar, which had been degraded as the mangroves in the area served as a disaster mitigation zone and a source of livelihood for local fishers. The program, which supports the Bali provincial government's "Nangun Sat Kerthi Loka Bali" initiative and the sustainable development goals (PT ITS Tecno Sains, 2023), is executed through a conservation partnership with KUB Segara Guna Batu Lumbang. This partnership grants limited access for the collection of Non-Timber Forest Products (NTFPs), traditional aquaculture, utilization of aquatic resources, and nature-based tourism.

2. METHOD

This study employs a descriptive qualitative method to understand the development strategy of the Batu Lumbang Mangrove Ecotourism CSR program. In addition to analyzing stakeholder involvement in the implementation of ecotourism, this research also highlights the importance of local cultural preservation. The objective of this study is to provide an overview of PLN Indonesia Power UBP Bali Company's strategy in developing the Batu Lumbang Mangrove Ecotourism Program. Data was collected using information obtained from informants and through non-participatory observation at the Batu Lumbang Mangrove Ecotourism site, located at Jalan Bypass Ngurah Rai, on the edge of the Mangrove Forest, near the Estuary DAM gate, Pemogan Village, South Denpasar District, Denpasar City, which served as the primary data source. The study also utilized program-related documents as a secondary data source to supplement the required information. Data collection was carried out by conducting purposively selected interviews with the following key persons:

- Officer Community Development PLN Indonesia Power UBP Bali Company;
- Administrator of Joint Business Group (KUB) Segara Guna Batu Lumbang;
- Administrator of Processor and Marketer Group (POKLAHSAR) Mina Lestari Batu Lumbang;
- Member of Muda-Mudi Mina Yowana Batu Lumbang;
- The Manager of Batu Lumbang Mangrove Ecotourism;
- Fisheries expert from Institute for Mariculture Research and Fisheries Extension (*Balai Besar Riset Budidaya Laut dan Penyuluhan Perikanan*) Gondol-Bali;
- Employees of Eco-Bali Recycling;
- Tourist of Batu Lumbang Mangrove Ecotourism

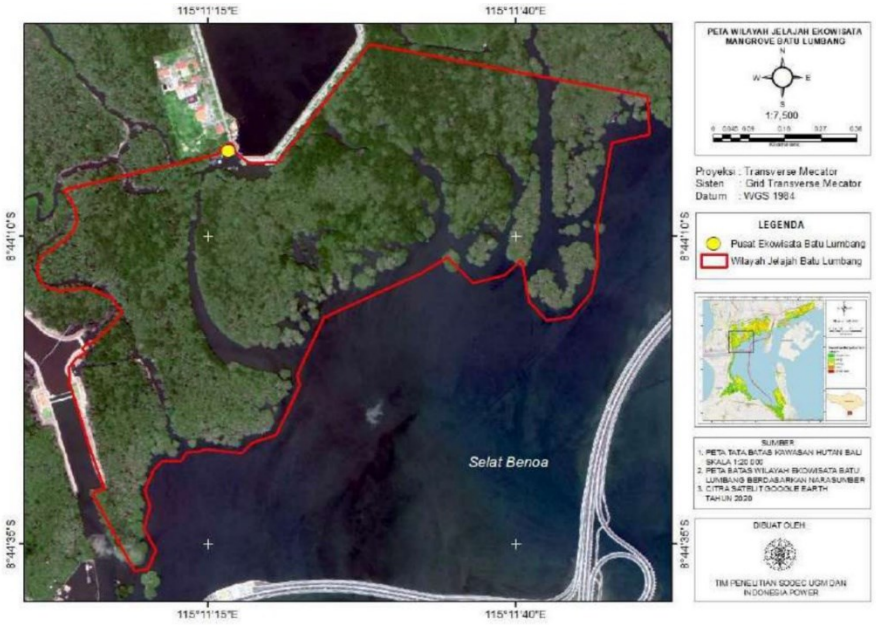
To ensure data accuracy, the researcher employed data triangulation on the information gathered during the study. This research process involved comparing data from various informants, as well as comparing data from interviews with the results of field observations or program-related documents. The analysis was conducted by explaining the credible data obtained in the form of narrative text. The technical data analysis was performed with reference to the concepts of Miles and Huberman (Matthew B. Miles, 2015), which include data reduction, data display, and conclusion drawing (verification). In this process, the researcher selected the data collected from the field according to the research focus and limitations. This data was then presented in a

narrative format and linked with relevant theories or concepts to generate the research conclusions. Researcher evaluated the development strategy of the Tahura Ngurah Rai Bali mangrove conservation area, aimed at improving the welfare of fishers and their families, using a SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis framework, as well as the Internal Factor Analysis Summary (IFAS) and External Factor Analysis Summary (EFAS) approaches. IFAS focuses on identifying and evaluating internal factors that can affect an organization's performance, including resources, capabilities, and core competencies. Meanwhile, EFAS analyzes external factors such as market trends, economic conditions, and competitive forces that could influence the organization (Damayanti, 2023). Both approaches were used in the analysis to evaluate the problem-solving strategies implemented by the company in the program's development.

3. RESULTS AND DISCUSSION

The Batu Lumbang Mangrove Ecotourism Area plays a crucial role in the sustainability of the mangrove ecosystem and is dominated by the *Rhizophora mucronata* mangrove species. It is located downstream of the Tukad Badung River, facing the Benoa Strait. Geographically, the area is situated at coordinates 8°44' - 8°45' S and 115°11' - 115°12' E. An interpretation of Google Earth imagery indicates that the Batu Lumbang Mangrove Ecotourism Area covers approximately 85.9 hectares. Given the supportive environment and in consideration of the company's operational area, PLN Indonesia Power UBP Bali Company has designated this region as a focus for its Corporate Social Responsibility (CSR) program.

The Batu Lumbang Mangrove Ecotourism Program targets the Segara Guna Batu Lumbang Joint Business Group (KUB) for the 2020-2024 period and the Mina Lestari Batu Lumbang Processor and Marketer Group (Poklahsar) for the 2021-2025 period. The program is managed by the Regional Technical Implementation Unit (UPTD) Tahura Ngurah Rai, located in Pemogan Village, Denpasar City. Its objective is to develop the mangrove conservation area through a community-based nature tourism program managed by a group of fishers. In addition to assisting in the development of infrastructure and facilities to support fishing, conservation, and ecotourism activities, the company also supports capacity building for the community and its institutions to manage tourism in accordance with conservation principles. Furthermore, the program facilitates the creation of tourism-supporting products derived from non-timber forest products (NTFPs) from the mangroves.



Source: CSR Innovation Study of PT Indonesia Bali Power

Figure 1. Map of the Batu Lumbang Tourism Area

Ecotourism development is regulated under the Minister of Home Affairs Regulation No. 33 of 2009 concerning the Development of Tourism in the Regions. This regulation stipulates that the principles of ecotourism development include: (1) compatibility between the type and characteristics of the ecotourism; (2) conservation, namely protecting, preserving, and sustainably utilizing the natural resources used for ecotourism; (3) economic benefits, which involves providing advantages for the local community, driving

economic development in the region, and ensuring the sustainability of the ecotourism business; (4) education, meaning it contains an educational element to shift perceptions, fostering care, responsibility, and commitment to environmental and cultural preservation; (5) providing satisfaction and experience to visitors; (6) community participation, which involves the active role of the community in planning, utilization, and control of ecotourism while respecting the socio-cultural and religious values of the surrounding community; and (7) accommodating local wisdom. Ecotourism development programs play a significant role in sustainable development by utilizing natural resources, promoting conservation, and improving the socio-economic conditions of local communities. These programs create a symbiotic relationship between tourists, host communities, and the environment, ensuring an equitable distribution of benefits and resource conservation. The following sections explain the main aspects of ecotourism's impact on sustainable development (Castanho et al., 2020). The economic benefits of ecotourism activities can create employment and skills programs (Mazmishvili, 2024; Siregar & Mijiarto, 2024). Environmental conservation benefits include conservation and educational activities for both local communities and tourists (Zukhri & Rosalina, 2024). Meanwhile, socio-cultural aspects encompass cultural preservation and community involvement in planning ecotourism activities (Siregar & Mijiarto, 2024; Nescience, 2024; Zukhri & Rosalina, 2024).

In line with the CSR program implementation report by PLN Indonesia Power UBP Bali Company, the Batu Lumbang Mangrove Ecotourism Program has accelerated waste management efforts and supported an increase in land cover from 79% to 82% in the Tahura Ngurah Rai Mangrove Conservation Area. To date, the KUB Segara Guna Batu Lumbang, along with other stakeholders concerned with the preservation of mangrove forests, particularly those on the southern coast of Denpasar, has achieved its target of planting 500 mangrove seedlings annually. The increase in land cover was accomplished through the planting of mangrove seedlings produced independently by KUB Segara Guna Batu Lumbang, as well as by utilizing the free mangrove seedling facilities of the BPDAS (Watershed Management Agency) Unda-Anyar, which manages the only modern nursery in Indonesia with a production capacity of 6 million mangrove seedlings across 17 species (Environmental Study of PLN IP Bali Company, 2023). The planting of seedlings is organized according to existing mangrove zones. The KUB Segara Guna Batu Lumbang even plants seedlings in the frontal zone, which is vulnerable to tidal-borne waste, using a spaced-cluster planting method and conservation pots. Furthermore, to ensure the survival of the planted seedlings, the group conducts maintenance in the form of monitoring, waste collection, and replanting (infilling) where necessary. Waste collection in the mangrove forest is a part of mangrove maintenance, for both newly planted seedlings and mature trees. The accumulation of waste on the mangrove pneumatophores (breathing roots) can cause the slow death of the trees if not cleared away.

Through the Batu Lumbang Mangrove Ecotourism Program, PLN Indonesia Power UBP Bali Company has provided guidance, training, and education, as well as facilities to enhance the knowledge and skills of the KUB Segara Guna Batu Lumbang. These activities were conducted in collaboration with the Muda-Mudi Mina Yowana Batu Lumbang youth group and the Management of the Batu Lumbang Mangrove Ecotourism as fostered partners. This CSR program imparts additional knowledge and skills that strengthen ongoing conservation and socio-economic empowerment activities. Furthermore, the program improves the economic standard of the local community by diversifying income sources, such as through roles as ecotourism management staff, boat operators, local guides, and educational activity instructors. Given the success and impact of the Batu Lumbang Mangrove Ecotourism Program, a further analysis was conducted using the Internal Factor Analysis Summary (IFAS) and External Factor Analysis Summary (EFAS) approaches to formulate problem-solving strategies for program management.

3.1 Influence of Internal Factor Analysis (IFAS): Strengths

The development of the Batu Lumbang Mangrove Ecotourism actualizes the primary potential of utilizing the mangrove forest's biodiversity as a main alternative tourist attraction on the island of Bali, which is one of the world's favorite tourist destinations. Citing data from UPTD Tahura Ngurah Rai, the area's authority, there are 38 native mangrove species and 17 associated mangrove species; 61 bird species; 4 reptile species; 30 crab species; and 8 fish species (Report, 2023; Ginantra et al., 2024). The location of the Batu Lumbang Mangrove Ecotourism, situated in Ring 1 of PLN Indonesia Power UBP Bali Company's operational area, is also strategic as it lies on the southern coast of Denpasar City, precisely within the golden triangle of Bali's tourism—Kuta, Sanur, and Nusa Dua—and is only about 6 KM from I Gusti Ngurah Rai International Airport. Unsurprisingly, the average number of visits to the Batu Lumbang Mangrove Ecotourism reached 1,814 visitors per month, with a total of 21,381 domestic tourists and 389 international tourists in 2024 (Setyaningrum et al., 2025). These visitors engage in activities such as fishing, exploring the mangroves by canoe or boat, and participating in educational tourism focused on waste cleanup, mangrove seedling planting, and the creation of products from mangrove-based Non-Timber Forest Products (NTFPs).

In developing the Batu Lumbang Mangrove Ecotourism Program, the company involves various stakeholders. Besides participating in planning discussions, they also collaborate in program implementation. This involvement is realized through cooperation with PLN Indonesia Power UBP Bali Company as a fostered partner group, and a Conservation Partnership Agreement, which serves as the permit for ecotourism area utilization between KUB Segara Guna Batu Lumbang and UPTD Tahura Ngurah Rai Bali. Additionally, the company collaborates with Eco-Bali Recycling for marine waste collection and has established an agreement with the Pemogan *Adat* (customary) Village to support sea-related traditional ceremonies of the Hindu-Balinese community. Support also comes from various other parties, such as the Denpasar City Marine Affairs and Fisheries Agency, which guides coastal community groups; the Gondol-Bali Research Institute for Mariculture and Fisheries Extension, which supports the provision of fish fry for floating net cage aquaculture; the Unda Anyar-Bali Watershed Management Center for mangrove seedling planting activities; and the Denpasar City Environmental and Sanitation Agency, which provides containers and transports waste. Further support is provided by the Marine and Coastal Resources Management Agency regarding marine debris issues and permits for fish cultivation, the Denpasar City Tourism Agency for capacity building in tourism and publicity, the Rotary Club of Bali Denpasar for providing facilities and infrastructure, and TVRI Bali and RRI Bali for publicity.

3.2 Influence of Internal Factor Analysis (IFAS): Weaknesses

The development of the Batu Lumbang Area into an ecotourism site has been underway since 2020, with ongoing efforts for improvement and the optimal utilization of existing facilities. The Batu Lumbang Mangrove Ecotourism already possesses adequate facilities for mangrove exploration activities, with 105 canoes and 8 boats, including 200 life vests and accident insurance for safety purposes. It also has 1 fishermen's hall, 1 jetty, 2 bathrooms, 2 changing rooms, 1 aquarium, 1 crab apartment unit, 1 floating net cage, 1 educational diorama, and 1 sundry shop (SODEC, 2020). To complement these facilities, further development and supporting infrastructure are required to enhance the site's attractiveness for tourism activities. As stated by the fisheries extension officer,

> *"In my opinion, what needs to be developed are better spots [for photos]. Because people don't need much else. As long as there's a good spot and food, that's enough, they can be happy. Because nowadays, many people like to take photos. The important thing is that when they take a picture and upload it, it looks good; that makes them happy" (Interview AW, 2024).*

Destination management within this group is also still limited, as the members were not previously employed in the tourism sector and some even lacked prior work experience. Consequently, there is a need for advanced capacity-building programs and certification. This was acknowledged by the Manager of the Batu Lumbang Mangrove Ecotourism:

> *"For future development at the ecotourism site, we still require training and development for the human resources—the employees/staff who work here—so they can be more agile and proficient in their work. Furthermore, the staff need to have certifications, such as a certificate for operating a boat, and for safety. We also want to develop the culinary side because we see that its potential is quite significant" (Interview DK, 2024).*

The Batu Lumbang Mangrove Ecotourism Management Group has involved the coastal community of Batu Lumbang, which includes the KUB Segara Guna Batu Lumbang, the Mina Werdhi Batu Lumbang Community Surveillance Group (POKMASWAS), the KSU Mina Sedana Batu Lumbang Multipurpose Cooperative, the POKLAHSAR Mina Lestari Batu Lumbang Processor and Marketer Group, and the Mina Yowana Batu Lumbang Youth Group. However, the management of the ecotourism site is still predominantly handled by the older male fishers, resulting in a suboptimal capacity to manage and market the destination using digital platforms. To date, they have only utilized the Instagram social media account @ekowisatamangrove.batulumbang to publicize activities and promote the tourist destination. As observed by an employee of Eco-Bali Recycling: Because if we're talking about human resources, the human resources are lacking. From the fishermen's group that I often see, perhaps attention could be given to getting the youth to join so that the ecotourism management can be better (Interview BY, 2024).

Furthermore, tourism activities such as mangrove exploration by boat and fishing from canoes are affected by natural conditions, as the site is located at the estuary of one of the largest rivers in Bali Province, the Tukad Badung River. This makes tourism activities dependent on natural factors like high tides, weather, and the dam floodgates. For example, during the rainy season when the floodgates of the Muara Nusa Dua Reservoir are

opened, the ecotourism management must ensure that no visitors are canoeing in the area near the floodgates or along the waterway leading to the Benoa Sea.

3.3 Farmer Economic Instituions Influence of External Factor Analysis (EFAS): Opportunities

In order to support income diversification through tourism development and enhance economic stability, the Batu Lumbang Mangrove Ecotourism was developed to conserve the mangrove forest and sustain the fishing profession, as desired by the KUB Segara Guna Batu Lumbang. This endeavor is carried out through the sustainable utilization of the mangrove forest by managing the tourist destination, engaging in traditional fishing and aquaculture, and utilizing Non-Timber Forest Products (NTFPs) in accordance with the Conservation Partnership Agreement between UPTD Tahura Ngurah Rai and KUB Segara Guna Batu Lumbang. This opportunity was highlighted by an employee of Eco-Bali Recycling: This way, the fishing group will become better known. Then, the economy of the fishers will also improve, where their income will not only come from the natural resources around the mangrove but also from ecotourism (Interview ST, 2024).

Beyond the fishers and their families, the development of the Batu Lumbang Mangrove Ecotourism also has the potential to expand its socio-economic benefits to the village level. In addition to facilitating sea-related religious ceremonies for the Hindu-Balinese community, such as the *nganyud* ceremony (the sea-drifting of cremation ashes) for the Pemogan *Adat* (Customary) Village community, the growth of ecotourism could also open new employment opportunities in the tourism sector for the coastal community of Pemogan Village. Awareness of this opportunity was expressed by the Head of the KUB Segara Guna Batu Lumbang,

> *"The economic potential is certain to provide welfare if the Batu Lumbang tourism can be managed well. Second, community empowerment. We can create jobs that will certainly be able to recruit labor from the community, especially from within the customary village environment and Pemogan Village" (Interview YY, 2024).*

To that end, PLN Indonesia Power UBP Bali Company is encouraging the development of mangrove educational tourism that is integrated with other surrounding tourist destinations, involving travel agents who cooperate with the ecotourism management group. Such development serves as a means to open mutually beneficial cooperation opportunities among tourism operators, while also providing an educational tourism experience for visitors, especially those with an interest in environmentally-conscious tourism activities like mangrove forest and sea turtle conservation. The concept of integration with other tourist destinations in the Benoa Bay Area was explained by a Community Development Officer: For tourism development, besides seeing the Turtle Island, there is also the Crab Village, and what else is there besides the mangrove. We see the potential to collaborate, we will form a partnership (Interview AN, 2024).

The development of the educational tourism concept at the Batu Lumbang Mangrove Ecotourism has the potential to be complemented by processed mangrove products and the fishermen's catch. This is because the mangrove forest also holds the potential for non-timber forest products and fishery resources, but their utilization must adhere to conservation principles and food safety aspects. As conveyed by the Manager of the Batu Lumbang Mangrove Ecotourism:

> *"For Non-Timber Forest Products (NTFPs), we must study them thoroughly because we do not want to over-exploit the mangroves. Excessive activity in utilizing mangrove fruits or leaves is also not good. Besides that, in-depth research is needed on the mangrove NTFPs themselves to determine if they are feasible and safe for human consumption. If it can be for the long term, that would be even better" (Interview DK, 2024).*

Although many parties have been involved in supporting the program's development, there are still opportunities for the involvement of other relevant stakeholders to realize the full potential of the Batu Lumbang Mangrove Ecotourism. This includes collaboration with other tourism destination managers in the Benoa Bay area, the Pemogan Village-Owned Enterprise (BUMDES), the Denpasar City Agency for Education, Youth, and Sports, the Denpasar City Tourism Agency, and other related stakeholders to strengthen efforts for behavioral change regarding waste issues and to provide education on mangrove forest conservation.

3.4 Influence of External Factor Analysis (EFAS): Threats

The issue of waste poses a threat to the sustainability of the mangrove forest as well as to tourism activities. The threat of damage to the mangrove forest is caused not only by plastic waste from the Tukad Badung River and marine debris from Benoa Bay, but also by the water quality of the Tukad Badung River,

which flows through the floodgates of the Muara Nusa Dua Reservoir. This is evident, for example, by the visible presence of detergent residue in detergent packaging waste that is thrown into the river and ultimately carried into the mangrove forest. As conveyed by a fisheries extension officer: Batu Lumbang is, in a sense, the final repository for waste. There's also the DAM, and the water quality is somewhat polluted, yes... That is truly a factor that creates a constraint (Interview AW, 2024).

Additionally, the potential for waste generation from visitors who do not adhere to regulations against littering in the water and mangrove areas is also recognized by the Manager of the Batu Lumbang Mangrove Ecotourism: We cannot control or supervise every visitor who comes to this mangrove forest. We cannot guarantee 100% that they will not throw trash in the mangroves. But this is not just a problem at our tourist site; it happens at almost all tourist destinations in Bali, especially nature-based ones (Interview DK, 2024).

On the other hand, ecotourism activities also serve as a means of education and awareness-raising about the waste problem. To support the fishers' routine waste cleanup activities in the mangrove forest and the fishermen's hall area, the wives of the fishers have participated in a training program to utilize plastic sachet packaging waste, turning it into souvenir products and even *keben* (traditional Balinese offering boxes). This was conveyed by an employee of Eco-Bali Recycling:

> *"Regarding the waste issue, that will be one of the responsibilities of the fishers. Because we cannot escape from waste in this area, as the ecotourism here is adjacent to the dam. And with the presence of tourism, we will be more active in protecting the environment because a clean environment will also be attractive for tourism" (Interview ST, 2024).*

Additionally, the location of the Batu Lumbang Area, situated on the border between the administrative territories of Denpasar City and Badung Regency, is feared to pose a threat of inter-regional conflict. The Batu Lumbang Area, precisely to the west of the Tukad Badung River, was declared part of Badung Regency's territory following national mapping. Nevertheless, the Batu Lumbang Area, as part of the Tahura Ngurah Rai Mangrove Conservation Area, falls under the authority of the UPTD Tahura Ngurah Rai, which is under the Bali Provincial Forestry and Environment Agency. Considering that the fishers who have long been active there are almost all from the community of Banjar Gelogor Carik, Pemogan Village, Denpasar City, the administrative affairs of the group fall under the purview of the Denpasar City Government.

3.5 Strengths-Opportunities (S-O) Strategy

The Based on the IFAS and EFAS results, the development strategy for the Batu Lumbang Mangrove Ecotourism is implemented as a CSR program by PLN Indonesia Power UBP Bali Company, focusing on the development of mangrove ecotourism based on climate-smart silvofisheries. Climate-smart silvofisheries is an approach that integrates sustainable aquaculture with mangrove conservation to enhance resilience to climate change. This strategy aims to improve food security, livelihoods, and ecosystem health by combining the benefits of the mangrove ecosystem with aquaculture practices (Zhao et al., 2023). As observed, this is implemented through fish cultivation in floating net cages and crab cultivation using an apartment system (vertical crab house) as part of the tourist attractions and to support plans for culinary development; the use of non-timber forest products as processed food products, beverages, and fabric dyes; and the development of conservation, tourism, and resource center activities.

The development as a resource center for the conservation and sustainable utilization of the mangrove forest is executed with a focus on developing and diversifying visit activities that facilitate educational tourism for school pupils and university students. This was articulated by the Manager of the Batu Lumbang Mangrove Ecotourism:

> *"Our target market is students, from school children up to university level. So, we actually want to have a video presentation that depicts the mangrove ecosystem in this Tahura Ngurah Rai. Starting with the tree species, one by one. We need to have photos, the names of the trees, their uses, the shape of their roots, the shape of their leaves. That way, we can explain the plant's specifications to the education participants. The same goes for the animals around Tahura Ngurah Rai. From the birds, reptiles, fish, shellfish, and also the underwater plants like bulung (a type of seaweed) and seagrass. We don't have anything like that yet. We don't have a video like that. So, it's very important for us to have a visual that tells the story of the mangrove ecosystem's life. If we only talk, they will surely have less understanding, comprehension, and interest in the educational activity" (Interview DK, 2024).*

This development innovation, which aligns conservation with the improvement of coastal community welfare, is based on the results of a CSR innovation study conducted by the company in collaboration with

academics through the Social Development Studies Center (SODEC) of Gadjah Mada University (UGM) in 2020. This concept is also recognized by the Head of KUB Segara Guna Batu Lumbang, who stated the context for the planned tourism sustainability: The ecotourism that we are developing is a form of limited ecotourism, where ecological and biological sustainability is already our priority and commitment to preserve. It must not be damaged (Interview YY, 2024).

Referring to the roadmap and the CSR program implementation report of PLN Indonesia Power UBP Bali Company, the Batu Lumbang Mangrove Ecotourism Program was initiated in 2020, targeting the KUB Segara Guna Batu Lumbang. In its development, the company facilitated the procurement of facilities and infrastructure, as well as necessary training and assistance. The procurement of facilities and infrastructure included the renovation of the entrance access, renovation of the jetty building, construction of bathrooms, handwashing stations, a monitoring post, and a *padmasana* (a Balinese Hindu shrine). The training provided was related to mangrove conservation efforts, fishing activities, and tourism. Meanwhile, the assistance provided by the company focused on legal permits, new group development, mangrove conservation, and ecotourism management.

In the company's assistance process, to support development and ensure continuity and sustainability, the Mina Lestari Batu Lumbang Processor and Marketer Group (POKLAHSAR) and the Mina Yowana Batu Lumbang Youth Group were successfully established. The POKLAHSAR Mina Lestari Batu Lumbang consists of 33 fishermen's wives who were economically impacted by the COVID-19 pandemic. Since 2021, this group has been responsible for producing products derived from non-timber mangrove forest resources. The Mina Yowana Batu Lumbang Youth Group was formed in 2021, comprising 35 children from fishing families, with the aim of fostering regeneration and securing the future existence of the fishing profession and ecotourism. For the operational management of the Batu Lumbang Mangrove Ecotourism, a dedicated management group was formed in coordination with the UPTD Tahura Ngurah Rai, the authority of the area. The UPTD granted a limited-use permit for the mangrove forest area through a conservation partnership cooperation scheme in 2022. This Ecotourism Management Group works in synergy with previously established community groups, including the KSU Mina Sedana Batu Lumbang, which was formed as a financial institution to support the economy of the fishers and the coastal community. The Batu Lumbang Mangrove Ecotourism Management Group consists of 4 members and 3 additional staff, supplemented by boat drivers and local guides according to the needs of the offered tourist attractions.

3.6 Weaknesses-Opportunities (W-O) Strategy

To overcome existing weaknesses, the Batu Lumbang Mangrove Ecotourism can be developed by leveraging its opportunities. The required development includes enhancing tourism-supporting infrastructure, strengthening the management and marketing of the destination, and establishing a digital-based resource center. These development efforts were addressed by making the Batu Lumbang Mangrove Ecotourism Program a flagship CSR program for PLN Indonesia Power UBP Bali Company in 2022, 2023, and 2024. In its implementation, the company packages social innovation programs that are linked with its other CSR initiatives. In 2022, a social innovation program was developed for utilizing non-timber forest products to create ecoprint products, titled SEKEN (Sekar Lestari Ecoprint for National Economic Development). The Ecoprint products, made from mangrove dyes, are produced through a system of interconnectivity among PLN Indonesia Power UBP Bali Company's fostered partner groups, namely POKLAHSAR Mina Lestari Batu Lumbang, KDS Sekar Jempiring, KUB Segara Guna Batu Lumbang, KSM Nangun Resik of Paksebali Village, and KTH Wana Kerta Lestari.

Zheng et al. (2023) state that the future of sustainable tourism, such as cultural tourism, is promising and intertwined with innovative trends and transformative possibilities within society. Similarly, the social innovation in this program in 2023, called MENYAMA BRAYA (Exploring the Mangroves to Empower the Community and Nature), emphasized governance aspects. This program strengthened the governance system and collaboration with relevant stakeholders, including supporting the expansion of ecotourism benefits at the village level. The company is also still constructing facilities to supplement and increase the variety of tourism activities offered, considering that natural conditions such as tides, weather, and the dam floodgates also affect the Batu Lumbang Mangrove Ecotourism's operations. As explained by the Head of KUB Segara Guna Batu Lumbang, "We can use the boats for a maximum of 4-5 hours, depending on the tide's volume. If the tide is quite high, it will take longer for us to maximize our time, 4 hours. That's at least 4 hours" (Interview YY, 2024). Subsequently, in 2024, a social innovation program will be implemented under the name MELUKAT (Honoring the Sea for Community Welfare). This program aims to strengthen the diversification of fishermen's enterprises through fish and crab cultivation, and to promote behavioral change in the community regarding waste issues through the development of a resource center. This resource center will address the need to optimize tourist visits for environmental learning, comparative studies, and benchmarking.

3.7 Strategy Strengths-Threats (S-T) Strategy

The Batu Lumbang Mangrove Ecotourism has endeavored to leverage its strengths to counter threats that could disrupt the program's sustainability. In its implementation, PLN Indonesia Power UBP Bali Company focuses on strengthening and expanding stakeholder engagement to preserve the mangrove forest and improve the economy of the coastal community. Stakeholder involvement is carried out at every stage of the program, from planning and implementation to monitoring and evaluation. Furthermore, the company publicizes its activities through banners, social media, and mass media, including online newspapers, as part of its mangrove forest conservation campaign.

3.8 Weaknesses-Threats (W-T) Strategy

To address weaknesses and mitigate threats in the operations of the Batu Lumbang Mangrove Ecotourism, tourism management and the provision of facilities and infrastructure are carried out in accordance with the principles of mangrove forest preservation. The Batu Lumbang Mangrove Ecotourism is developing edu-tourism packages (mangrove educational tourism) and a resource center in an effort to increase public environmental awareness regarding mangrove forests, the waste problem, and the utilization of new and renewable clean energy, which is a core competency of PLN Indonesia Power UBP Bali Company as a power generation company. The development of these edu-tourism packages and the resource center is packaged and integrated with other tourist destinations in the Benoa Bay area. These include the Tahura Ngurah Rai Bali Mangrove Education Center, the Muara Tukad Solar Power Plant (PLTS) which was a showcase for the Indonesian G20 Presidency, as well as the Turtle Island and the Crab Village.

4. CONCLUSION

Based on the SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis, PLN Indonesia Power UBP Bali Company implements the concept of climate-smart sylvofisheries as the foundational strategy for the development of the Batu Lumbang Mangrove Ecotourism program. This strategy, derived from the analysis of strengths and opportunities (S-O), involves aligning mangrove forest conservation activities with the utilization of non-timber mangrove forest products, environmentally friendly fish and crab aquaculture, and educational tourism. Next, the strategy based on the analysis of weaknesses and opportunities (W-O) includes establishing the Batu Lumbang Mangrove Ecotourism Program as a flagship program and developing social innovation initiatives focused on creating tourism products from non-timber mangrove forest products and the fishermen's catch, as well as strengthening collaborative ecotourism governance to function as a resource center. To address the waste problem and location-based threats, the strategy implemented based on the analysis of strengths and threats (S-T) involves strengthening and expanding stakeholder engagement, as well as publicizing the program and its activities as part of a mangrove forest conservation campaign. The strategy developed from the analysis of weaknesses and threats (W-T) includes the development of edu-tourism (mangrove educational tourism) packages and a resource center, accompanied by the facilitation of necessary infrastructure, training, and assistance.

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