

## THE TRANSFORMATION OF COMMUNITY-BASED MANGROVE CONSERVATION TO COASTAL TOURISM ON THE NORTHERN COAST OF JAVA, INDONESIA

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### Abstract

Villages are a new focal point for economic growth through village-based tourism. As tourism interest in villages increases, mangrove forests are viewed from an economic perspective, shifting their original role to a conservation perspective. Hence, the research aims to (1) analyze the conversion of the mangrove ecosystem for village ecotourism, (2) analyze the leverage factors and inhibit the development of coastal tourism and (3) formulate a strategy for developing mangrove-based coastal tourism village areas as ecotourism destinations. This research uses a qualitative approach. A qualitative survey, in-depth interviews and focus group discussion were explored in the Cirebon and Brebes Regencies, Indonesia. The data was analyzed descriptively using the business model canvas (BMC) model and Strengths, Weaknesses, Opportunitie and Threats (SWOT) analysis. The research findings indicate that the socio-economic transformation from mangrove conservation to village ecotourism occurred in several dynamics, including policy, management, institutional, business models and local community economic dynamics. Various supporting and inhibiting factors in the development of the coastal tourism economy are identified across multiple dimensions. The paramount strategy for advancing mangrove-based coastal tourism villages involves the legality of management of mangrove coastal tourism villages and strengthening the role of stakeholders in the development of mangrove ecotourism villages.

**Keywords:** Mangrove conservation; Coastal tourism; Tourism village; Ecotourism;  
Local community; Socio-economic transformation; Sustainability.

### Introduction

Geographically, rural areas constitute an essential element in national development. Rural Indonesia has diverse characteristics, encompassing natural resource potential, social, cultural and economic infrastructure, education, health and developmental progress. Enacted through Law No. 6 of 2014 concerning Villages, the Indonesian government designates village communities as the subject of national development to advance the economy and prosperity, overcome inequality and poverty and improve the quality of community life. Village economic development is a process where the village government and community manage the potential of existing local resources and form a partnership pattern between the village government and the

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private sector to create new jobs and stimulate the development of the economy in rural areas [1]. Villages have emerged as a new focal point for economic growth driven by initiatives to develop village-based tourism since 2014. Tourism is one of the activities that develop the village economy. Through the development of village-based tourism, communities at the grassroots level can actively participate in economic activities.

Tourism is generally categorized into mass tourism and thematic tourism. Currently, there is a shift in tourism trends from mass tourism to alternative tourism, leading tourists to seek destinations that are more environmentally and socially friendly, known as ecotourism. This positive trend towards developing tourism aligns with the concept of ecotourism [2]. One manifestation of this evolving tourism trend is Village Tourism, called "*Desa Wisata*" in Indonesian. Coastal and marine tourism represents at least 50 percent of total global tourism. In 2023, a total of 4,674 tourism villages will be spread across all provinces in Indonesia, with 11,306 will be classified as marine tourism villages [3]. Marine tourism is divided into three zones: coastal zone, sea surface and underwater. Coastal areas are potential areas with diverse resources and can be utilized in various ways, including tourism, especially marine ecotourism [4]. Developing a coastal tourism village is the focus of studies on the mangrove ecosystem. The national mangrove map shows that the area of the mangrove ecosystem in Indonesia is 4,120 thousand hectares: 0.24% is on the coast of West Java Province and 0.37% of Central Java Province [5]. Mangrove forests play a crucial role in the environment and economy of communities in coastal areas [6]. Numerous indicate that the development of mangrove ecosystem-based ecotourism offers various business prospects for the community and, at the same time, maintains ecological sustainability (conservation) [4, 7-10].

Tourism development in coastal villages is primarily related to natural scenery, ecosystem characteristics, distinctive arts and culture and community characteristics as the main strengths of each region. Nevertheless, the construction and development of coastal tourism villages face several problems that can jeopardize coastal ecosystems' sustainability and community's income [11]. Mangroves, originally designated as objects of conservation, frequently fail to fulfill their objectives due to a predominant emphasis on their role as tourism destinations. As tourism interest grows, mangrove forests are viewed from an economic perspective, shifting their original role to conservation. In addition, the village government and tourism village managers still need a comprehensive plan for developing coastal tourism due to the limited human resources available. Tourism village development policies have also encountered a lack of community involvement. Coastal tourism village managers grapple with two contradictory interests within the community: one faction wants mangroves to function for environmental preservation, while the other desires extensive utilization of mangroves for economic. This requires the participation and readiness of the government and stakeholders to ensure that these conflicting can be harmonized so that they become the driving force for creating sustainable economic growth within the village.

The development of coastal tourism villages can be integrative and collaborative by emphasizing community-based and sustainable development principles. Stakeholder support for the development of a coastal tourism village based on a mangrove ecosystem on The North Coast of Java is classified into the penta-helix stakeholder's collaboration including academics, business, government, media, community. The management of coastal tourism villages on the north coast of Java is supported by various regulations ranging from town, district, provincial, to central (ministerial) levels, as well as institutions in the village level such as Community-based Surveillance group (called: *Pokmaswas*), Community-based tourism awareness group (called: *Pokdarwis*) and Village-owned Enterprises (called: *BUMDes*). However, several challenges persist, including overlapping institutional functions, conflicts of interest, the absence of simultaneous program synergy from the government, budgetary limitations, the limited quality of human resources along the coast and the failure to designate coastal tourism villages as a priority tourism attraction. These factors contribute to suboptimal development in

the tourism sector. The existing problems result in development programs for coastal tourism villages in coastal areas needing to be more optimal and becoming a crucial issue for sustainability in tourism development [12]. The core concept of sustainable tourism development (STD) revolves around three fundamental dimensions: economic, social and environmental. However, there are often differences in vision between the government and the needs of society [13]. It is essential to pay more attention to the sustainability of coastal tourism villages because prosperous tourism villages have reduced the number of underdeveloped villages and transitioned them into independent villages [14]. Participation in tourism development in developing countries is often limited due to a lack of attention to the socio-cultural, economic and political conditions in the tourist areas to be developed [15]. Therefore, two theoretical foundations, namely Sustainable Tourism (ST) and Community-Based Tourism (CBT), are critical to this study. It can also be called the theory of Sustainable - Community-Based Tourism (SCBT), which is currently widely used as a reference in tourism studies. The approach to managing a coastal tourism village is dynamic and the existing condition of the village is the key to sustainability in developing a sustainable coastal tourism village.

In 2010, Indonesia had a mangrove forest area of 3.49 million hectares (20% of the world's mangroves were 15 million hectares), but 1.82 million ha of Indonesian mangroves were damaged [16]. Table 1 shows that from 2013 to 2019, Indonesia's mangrove forest area nationally amounted to 834,545 Ha. However, as many as 166,491 Ha (20%) are in critical condition [17]. The damage was caused by intensive mangrove conversion into shrimp farming in the 1990s, especially in Java, Sumatra, Kalimantan and Sulawesi, to increase exports of fishery commodities [18].

**Table 1.** Status of Indonesian Mangrove Forests for the 2013-2019 Period

Islands	Status		Critical Percentage (%)
	Good Condition (Ha)	Bad Condition (Ha)	
Sumatera	204,186	103,339	50
Jawa	15,609	-	-
Kalimantan	335,475	37,192	11
Sulawesi	39,591	11,485	29
Bali, NTB and NTT	22,299	7,262	32
Maluku and North Maluku	60,330	11,485	7.3
Papua	172,662	2,808	1.6

Source: The Ministry of Environment and Forestry [5]

The community has long used mangrove forests but is currently facing problems that could potentially cause mangrove extinction. The loss of mangroves means the loss of ecological niches and contributes negatively to coastal economies, where coastal communities depend on marine resources and industrial fisheries [19]. Pressure on mangrove ecosystems is caused by population growth, land reclamation, increasing mangrove exploitation, land arising from sedimentation, mangrove forest conversion, socio-economic, institutional problems and legal arrangements in coastal areas and poorly updated information data [20]. In some places, mangrove ecosystems have been completely transformed into other ecosystems and there is a growing threat to unspoiled mangrove ecosystems. Land tenure rights conflicts are at the core of mangrove use conflicts [21]. Community activities in coastal areas and high demand cause mangrove forests to experience pressure that can threaten their existence and function. Ultimately, this condition harms humans and nature because of the reduction in mangrove functions ecologically and economically [22]. Mangrove forest conservation efforts are carried out to restore the function of mangrove forests that have been damaged. The success of mangrove conservation requires the role of supervision and maintenance in a sustainable manner, also determined by the participation of the community in the area around the mangrove [23]. One of the initiatives to obtain environmental as well as economic benefits from

sustainable coastal areas is the development of mangrove ecotourism [4, 7-8, 24-26]. The economic and ecological benefit of mangrove forests is more significant than other fisheries business (aquaculture) [27]. Table 2 shows several articles that discuss mangrove ecotourism benefit in Indonesia and at the global level.

**Table 2.** An overview of the reviewed articles

Author(s)	Findings
<i>Intyas et al.</i> [28]	The foundation and <i>pokmaswas</i> apply the concept of conservation-oriented in the ST
<i>Bhowmik et al.</i> [29]	Aquaculture and agriculture are the predominant drivers of global mangrove deforestation. Prioritizing coordination and development of global policies for mangrove conservation
<i>Purwoko et al.</i> [25]	Community-based mangrove tourism creates visitor spending (income for the community).
<i>Iqbal &amp; Hossain</i> [30]	Age, monthly income and school years are influential factors in determining tourists' WTP for restoring the Sundarbans ecosystems. The estimated WTP is Bangladeshi Taka (BDT) 64.54. Investment in restoration creates a guarantee to earn BDT 11.81 billion per annum.
<i>Effendi et al.</i> [8]	The Bandar Bakau Dumai (BBD) mangrove conservation in good condition and hasn't changed. Increasing human capacity and strengthening the government, industry and sponsors in developing facilities are the critical strategies.
<i>Firdaus et al.</i> [26]	The BBD legal aspects of mangrove conservation and ecotourism are not comprehensive.
<i>Abidin et al.</i> [4]	The Tamban coast mangrove area has ecotourism potential, attracts tourists and strengthens the branding location. The mangrove ecotourism provides social-economic and ecological benefits.
<i>Khakhim et al.</i> [31]	The coastal environment is experiencing extensive agricultural land conversion for the airport, increased tourism growth and pressure and modifications in the mangrove ecosystem utilized for mass tourism, which can disrupt sustainability and reduce the mangrove function

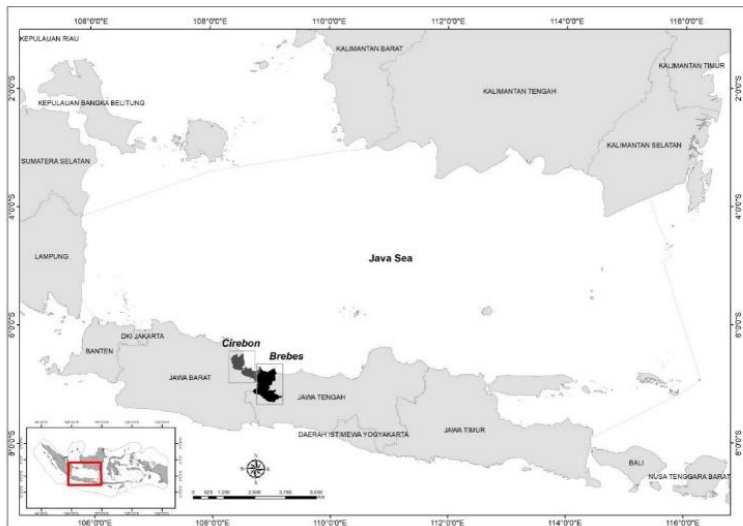
Utilization of mangrove areas for community-based tourism in a restricted manner is to address the sustainable mangroves conservation and providing economic and ecological benefits to communities and the environment. Village tourism is a part of tourism development that focuses on the contribution of the community around the village and the preservation of the rural area environment through tourism activities. The villagers have tourism products with cultural value and traditional characteristics [31-32]. In addition, it also pays attention to environmental sustainability and economic improvement of the community through ecotourism management. Numerous prior research findings related to the theory of STD and community-based tourism have been widely studied [14, 33-40] so that it becomes the basis for research into the development of mangrove-based coastal tourism villages. Thus, the objectives of this research are: (i) examining the conversion of the mangrove ecosystem as a village; (ii) analyzing the leverage factors and inhibiting the development of the coastal tourism economy; (iii) formulating a strategy for developing mangrove-based coastal tourism village areas as ecotourism destinations.

## Experimental part

### Materials

This research was conducted from May to October 2023 in Mundu Pesisir Village of Cirebon Regency (West Java Province) and Kaliwlingi Village of Brebes Regency (Central Java Province) (Fig. 1). Both research locations were determined with the following criteria, namely: i) a tourist village, the Ministry for Marine Affairs and Fisheries of the Republic of Indonesia has approved the village with a ratio of low and high scores, ii) a mangrove-based tourist village with a comparison of pioneering and advanced tourism village category status, iii) location strategic at the main road across the northern coast of Java, iv) easiest of access for visitors. Mundu Pesisir Village has mangroves covering an area of  $\pm 7$ ha as the main

attraction/potential of the Coastal Tourism Village, while Kaliwlingi Village has mangroves covering an area of  $\pm 210$ ha.



**Fig 1.** Research Location

This research used a qualitative descriptive method through a case study approach. Primary data was obtained from interviews with research respondents within five stages: i) direct interviews using structured questionnaires; ii) in-depth interviews with key informants; iii) observation through observing and recording the agencies involved in the research and the objects (targets), iv) Focus Group Discussion (FGD) with internal management and several parties outside the core management team who have knowledge capacity regarding the field of development strategy to enrich the views regarding future business models and v) documentation obtained through several data and information in the field in the form of administrative documents obtained through interviews, observations and secondary data. Selected respondents consist of the users of coastal tourism villages, such as tourism businesses, tourists, fishermen, fish cultivators, local governments (both at village, district and central levels), non-governmental organizations (NGOs), *BUMDes* managers, academics and other stakeholders. Informants in FGD and in-depth interviews are stakeholders or users of natural resource goods and services directly and indirectly, such as the head of the community-based surveillance group (called: *Pokmaswas*), the head of the community-based tourism awareness group (*Pokdarwis*), head of the village, community leaders, non-governmental organizations and academics. Secondary data, such as scientific journals or publications, articles and reports, were collected through a desk study.

### **Methods**

The design of developing a business model in a coastal tourism village was carried out through a series of analyses, starting with a descriptive study that analyzed the conversion of mangroves as conservation areas into current coastal tourism villages from a governance, institutional, social and economic perspective. Identifying the nine elements of Business Model Canvas (BMC) is needed to know the targets and objectives coastal tourism village managers want to achieve. Then, each piece is assessed in detail with a strengths, weaknesses, opportunities and threats (SWOT) analysis. This analysis describes a business strategy from the collaboration of internal factors (strengths and weaknesses) and external factors (opportunities

and threats). Identifying the nine elements of BMC and SWOT is the basis for designing a future coastal tourism village business model.

The stages of the data analysis method in this research were carried out in two locations. Based on an interactive model [41-43], the data analysis stage begins with data collection, reduction, presentation and conclusion. Data was collected through three stages. First, analysis of Business Model Canvas (BMC) that includes customer segments, value propositions, channels, customer relationships, key activities, key partnerships, key resources, cost structures and revenue streams to determine the condition of the coastal tourism villages of Mundu Pesisir and Kaliwlingi. We use the Business Model Canvas (BMC) developed by Osterwalder & Pigneur [44]. In this research, the BMC is a business model framework that describes how an organization or company creates, represents and captures value and aims to determine strategy in a business, particularly for coastal tourist villages [44, 45]. Second, a SWOT analysis for each block of the Business Model Canvas to determine strengths, weaknesses, opportunities and threats. SWOT analysis is a planning instrument to make determining a company's strategic plan easier [46]. The third step is choosing a strategic plan for developing the Mundu Pesisir and Kaliwlingi coastal tourism villages. In the development of alternative strategies, the four SWOT matrix is employed to facilitate the alignment of strengths and opportunities (SO strategies), strengths and threats (ST strategies), opportunities and weaknesses (WO strategies), as well as weaknesses and threats (WT strategies).

The SWOT analysis (Strengths, Weaknesses, Opportunities and Threats) systematically identifies various factors to formulate a company's strategies. It is based on a logical approach to maximize strengths and opportunities while minimizing weaknesses and threats. Making strategic decisions is intricately linked with developing a company's mission, objectives, strategies and policies. Planners must analyze strategic factors (strengths, weaknesses, opportunities and threats) in the existing or situational analysis [47]. Data sources are collected from respondents, o are Weights are assigned to these factor groups and the internal and external factors using the paired comparison method.

The analysis of social facts relies on a descriptive and qualitative approach, drawing inspiration from Scott's three pillars of institutional analysis - normative, regulative and cognitive dimensions [48]. This analysis provides an overview of coastal tourism's current state and potential through triangulation and cross-reference information used from multiple sources to validate findings and present a more accurate depiction of the subject under study.

## Results and discussion

### *Mangrove Transformation: Ecotourism as a Tool of Conservation*

The transformation in the management of mangrove areas in Mundu Pesisir and Kaliwlingi Villages from the management of conservation areas to coastal tourism villages is influenced by several aspects: a). policy changes, b). management institutions and c). community socio-economics. The changes in policies affected changes in management institutions and the socio-economic conditions of coastal communities around coastal tourism villages. The explanation of these aspects is as follows.

#### *a) Policy Changes on Coastal Tourism and the Village*

Management of coastal tourism activities has several legal regulations, but formal rules on the village regulations level have not been decided. At the Mundu coastal tourist village, there are no formal regulations at the village level that regulate tourist entrance tickets price at the Indonesian Rupiah Rate (IDR) of 5.000 per person. This regulation is an essential factor for allocating benefits from coastal tourism activities. Meanwhile, the Kaliwlingi tourist village has the rule for giving the entrance ticket charge for coastal tourism services. Domestic tourists have been charged IDR 20,000 per person. This amount is divided into IDR 8,000 (Income), IDR 7,000 (tour operator), IDR 1,000 (Village Government Revenue or *PADes*), IDR 2,000

(Regency Government Revenue or *PAD*), IDR 1,000 (Youth Organization or called: *Karang Taruna*), IDR. 500 (Insurance), IDR 500 (donation). This management has been discussed and agreed upon by various parties. However, just like in Mundu, they have no formal regulations at the village level.

A Village Medium-Term Development Plan (called *RPJM-Desa*) is one of the policy tools that can determine coastal tourism development. *RPJM-Desa* is a six-year planning document that contains the direction of village development. In both research locations, *RPJM-Desa* has not included programs for the development of coastal tourism. It was affected by the absence of village financial allocation for the development of coastal tourism. At national level, the coastal tourism program is assisted by MMAF. The community can apply the proposal and fulfil the requirements. If appropriate, the proposal can be accepted and processed to get funding from the coastal tourism village program.

In another experience, the Kaliwlingi coastal tourism village had a success story in managing coastal tourism in the village. Local government gives valuable support for tourist activity based on mangroves, such as establishing several regulations. The local government of Cirebon Regency provides some existing regulations to support coastal tourism villages, namely: i) Cirebon City Regulation Number 7/2019 concerning the Cirebon City Regional Tourism Development Master Plan for 2019-2025, ii) Cirebon Regent Regulation number 57/2022 concerning the establishment and development of tourist villages in Cirebon Regency, iii) Cirebon Regent Decree No. 556/Kep. 429-*DISBUDPAR*/2022 concerning the Determination of Tourism Villages in Cirebon Regency, iv) Institutional regulations for managing *Dewi Bahari* are regulated at the village level but have not yet been established as village regulations.

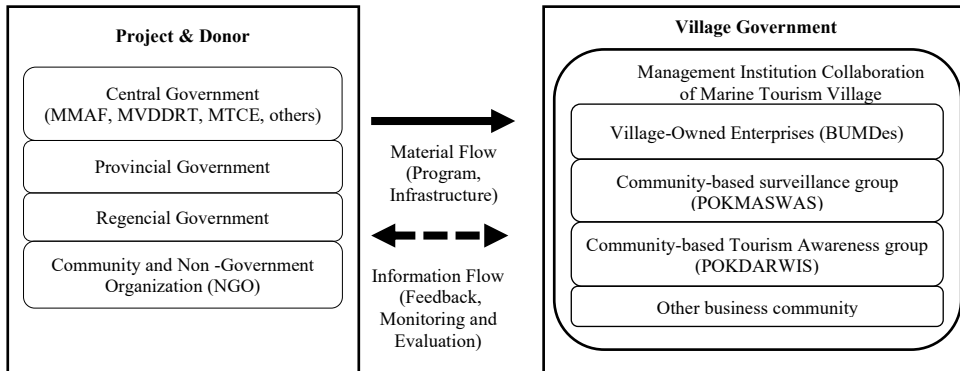
In the Brebes Regency provide regulations of coastal tourism villages namely: i) The Central Java Governor Regulation Number 53/2019 concerning the Guidelines for Implementing Central Java Province Regional Regulations Number 2/2019 concerning Empowerment of Tourism Villages in Central Java Province, ii) Brebes Regency Regulations Brebes Number 11/2021 concerning Tourism Villages, iii) The Brebes Regent Decree No. 523/273/2015 as part of the 5.000 hectares reserve area for coastal water conservation areas in Brebes Regency with the nomenclature Mangrove Protection Area (DPM) or coastal protected area as a buffer zone for coastal and marine ecosystems in preserving marine resources, iv) Decree of the Head of the Tourism Office Youth Culture and Sports Brebes Regency No. 556/33B/2015 concerning the Determination of Kaliwlingi Village, Brebes District, Brebes Regency as a Tourist Village, v) Brebes Regent Decree No. 556/357/2022 concerning Determination of Tourism Villages in Brebes Regency, vi) Kaliwlingi Village Regulation Number 008/2016 concerning the Establishment and Management of Village-Owned Enterprises, vii) Kaliwlingi Village Regulation, Brebes District, Brebes Regency Number: 25/III/2016 concerning Ecological Tourism Mangrove and Pasir Island, viii) Association of Coastal Forest Conservation Community Groups which has legal entity Number 46 dated August 19<sup>th</sup> 2015 and ratified by the Minister of Law and Human Rights Number AHU-0003233.AH.01.07. 201 and ix) Determination of the Gara Task Force Pokmaswas Number SK 440/14/II/2020 by the Head of Kaliwlingi Village and confirmed by Notarial Deed No. 6 of 2020.

#### *b) Institutional Dynamics in Coastal Tourism Management*

The initiation of mangrove coastal tourism generally comes from the activities of the Pokmaswas supported by the marine fisheries government. This group was formed on the initiative of the community, which is aware of the sustainability of marine and fisheries resources. The priority function is to protect marine and fisheries resources and inform law enforcement officers of suspected violations in the marine and fisheries sector. Activities carried out by the community to protect marine and fisheries resources are carried out by replanting mangrove trees. Mangroves have economic and environmental benefits. This activity is community self-help supported by the government through constructing initial facilities

through mangrove tracking. The facility is designed to supervise or monitor mangrove growth and planting. However, it can also be used as an economic potential for mangrove tourism. The growth development the mangrove tourism economy encourages other government sectors to contribute, such as the Tourism and Cultural Office (called *Dinas Kebudayaan dan Pariwisata*) and Community and Village Empowerment Office (called *Dinas Pemberdayaan Masyarakat dan Desa*). Both governments are responsible for the *Pokdarwis* institution [49] and *BUMDes* institution [50] can contribute to coastal tourism.

Technically, the *Pokmaswas* are not responsible for the economic contribution of mangroves but have experience in managing mangrove forests. On the other hand, the *Pokdarwis* have the function of developing the mangrove tourism economy through community involvement but are not related to the mangrove planting process. These two groups were formed based on community initiatives supported by the government. Another group is *BUMDes* entities, which the village government starts to advance the village through the business potential that exists in the village. *BUMDes* are structurally responsible to the village government because the initial funding source for *BUMDes* is through village fund allocations. *BUMDes* managers operate with an agreed salary/wage system. Administratively, coastal tourism villages are under the authority of the village government. Based on observations, coastal tourism village managers in both locations are a source of problems. With village laws, all village activities are currently managed under the village government's management. Therefore, management institutions in the future will be directed at *BUMDes* but need to involve groups that have initiated mangrove coastal tourism fully. Technically, existing coastal tourism managers can become one of the business units within *BUMDes*, implementing more adaptive activities. The management institution does not have to be a *BUMDes* entity but can be appointed as a coastal tourism manager through the village government. Based on the explanation, we propose a mangrove-based coastal tourism management model (Fig. 2).












**Fig 2.** Proposed institutional management of mangrove-based coastal tourism villages

***Business Model Canvas for Coastal Tourism Village Management***

Sustainable ecotourism development is influenced by several aspects, such as the level of people's habits and attitudes towards the environment, the level of government policy support in developing ecotourism, knowledge about environmental conservation itself and the responsibilities of the parties involved [42]. Indonesia's ecotourism management model is based on ecosystems, species, community empowerment and the establishment of national parks. However, the model has not been able to solve the problem optimally. One approach that can be used is the BMC. The BMC model approach is considered innovative so that an organization can survive in dynamic developments [51]. BMC consists of nine elements used to map a better business model for developing a Coastal Tourism Village, including key partners, key activities,



key resources, bargaining power/advantages, customer relationships, distribution channels, market segmentation, costs expenses and income. The current condition of the coastal tourism village BMC model is presented in figure 3.

<p><b>Key Partners</b> </p> <p><i>Government:</i></p> <ul style="list-style-type: none"> <li>Center: MMAF, MPWH, MTCE, NRIA</li> <li>Regencial: Fisheries Department, Environment Department, Tourism Department, Village Government</li> </ul> <p><i>Non-Government:</i></p> <ul style="list-style-type: none"> <li>Local Community (fishers, merchant, processors)</li> <li>Pokmaswas</li> <li>Pokdarwis</li> <li>Private company</li> <li>Village government owned enterprise/s</li> </ul>	<p><b>Key Activities</b> </p> <ul style="list-style-type: none"> <li>Mangrove Tour Service</li> <li>Marketing and Promotion</li> <li>Maintenance of mangrove ecosystem services</li> </ul> <hr/> <p><b>Key Resources</b> </p> <ul style="list-style-type: none"> <li>Natural Resources</li> <li>Human Resources</li> <li>Physical Resources</li> <li>Financial Resources</li> </ul>	<p><b>Value Propositions</b> </p> <ul style="list-style-type: none"> <li>Performance (Natural beauty of mangrove forests)</li> <li>Price (Entrance fees, parking rates, food prices, and boat rentals are quite affordable for tourists)</li> <li>Cost reduction (Close to the city)</li> <li>Attraction (Mangrove tracking is not monotonous)</li> </ul>	<p><b>Customer Relationships</b> </p> <ul style="list-style-type: none"> <li>Friendliness of services</li> <li>Community friendliness</li> </ul> <hr/> <p><b>Channels</b> </p> <ul style="list-style-type: none"> <li>Website promotion (assisted by local government)</li> <li>Social media promotion (Whatsapp, FB, Instagram)</li> <li>Person to person promotion</li> </ul>	<p><b>Customer Segments</b> </p> <ul style="list-style-type: none"> <li>Domestic tourists</li> <li>Foreign Tourists</li> <li>Special interest tourism (school children, mangrove product training).</li> </ul>
<p><b>Cost Structure</b> </p> <ul style="list-style-type: none"> <li>Operational cost (wages, electricity)</li> <li>Infrastructure maintenance cost (Tracking, boat)</li> <li>Promotion cost</li> </ul>		<p><b>Revenue Streams</b> </p> <ul style="list-style-type: none"> <li>State Budget (APBN)</li> <li>Local government budget (APBD)</li> <li>Corporate Social Responsibility (CSR)</li> <li>Entrance and Parking fee</li> <li>Rent a place fee</li> </ul>		

**Fig 3.** BMC for Mangrove Coastal Tourism Villages on the North Coast of Java, Indonesia

Information: MMAF = Ministry of Marine Affairs and Fisheries, MPWH = Ministry of Public Works and Housing, MTCE = Ministry of Tourism and Creative Economics, NRIA = National Research and Innovation Agency

Identify the coastal tourism village business model using the BMC approach, based on in-depth interviews with the Head of the Food Security, Agriculture and Fisheries Office, Head of the Culture and Tourism Office, Head of Mundu Pesisir Village, Head of Kaliwlingi Village, Village Community Empowerment Service, *Pokdarwis* Treasurer, Chair of *Pokmaswas* and based on field observations. The result is as follows:

**Key partnerships** are building partners formed by the industry in carrying out its business model. Key partnership elements in the Coastal Tourism Village use optimization and economy of scale. Types of partners and roles of partners in the development of the Coastal Tourism Village, as in Table 3. The decline in visitors is due to boredom because no additional mangrove tracks or other attractions exist.

**Key activities** carried out by the industry in carrying out its business model are tourism services for economic and environmental interests, marketing and promotion through social media Facebook (FB) and Instagram (IG) for economic interests and maintenance of mangrove ecosystem services for the environment. The main purpose of developing the Mundu Pesisir Coastal Tourism Village is because there is a buildup of rubbish on the coast, so tourism can help reduce the waste. In early 2023, there will be up to 1,000 visitors, both local and foreign, thus attracting tourist enthusiasm from browsing social media.

**Key resources** are the primary resources in implementing the business (Table 3). The key resource elements are:

1. Natural Resources consist of mangrove forests covering an area of 7-210 hectares.

2. Human Resources consisting of seven tourism managers (Four people from the *Pokdarwis* and three supervisory community groups, ten employees (tour guides = *Pokdarwis* and supervisory community group, cleaners = *Pokdarwis*, parking attendant = community, entrance guard, social media manager = *pokdarwis*).

3. Financial resources from government assistance and tourist/entrance tickets. Assistance from the government is used for infrastructure development (primary and supporting), which comes from the National and Local Government Budget (APBN and APBD).

4. Physical resources consist of a land area of 15ha, tourist facilities (prayer room, toilet, rubbish bin, parking area, canteen, reading park, hut) and types of attractions (photo and selfie spots) from the government and BUMN.

5. Potential cultural attractions: mask dance/welcoming dance, tambourine.

**Table 3.** Types and Roles/Functions of Partners in the Development of Mangrove-Based Coastal Tourism Villages

No	Partner	Role/Function
1	<i>Pokdarwis</i> , BUMDes	Tourism business management
2	Village government, marine and fisheries service, environmental services, Government tourism office, Department of Public Works and Spatial Planning, MMAF, NRIA	Development of infrastructure/public facilities
3	Community	Environmental management (garbage)
4	<i>Pokmaswas</i> , <i>Pokdarwis</i>	Promotion (Instagram, Facebook)
5	Village government	Landowner
6	Community (traders)	Culinary seafood/stall provider
7	Fishers	Attraction provider (boat rental)
8	<i>Pokmaswas</i> , <i>Pokdarwis</i>	Manager of visitor security and safety
9	<i>BUMDes</i> , Banking	Financial provider

**Value Propositions** are the bargaining power of an industry that constructs a consumer paradigm for choosing products or services. The value proposition element is in the form of added performance value (natural beauty of the mangroves); value-added price: affordable entrance ticket prices, parking rates, food prices and boat rentals; added value for cost reduction, because it is close to the city (but there is no public transportation), the uniqueness of the tourist spot/attraction: mangrove tracking.

**Customer relationships** are relationship efforts that the industry builds explicitly with its consumers. The customer relationship element is the personnel assistance category in the form of friendly service.

**Channels** are used by industry to communicate their value to consumers. The channels element uses two channels: social media and partnerships. For social media in Instagram and Facebook, the partnerships themselves are tourism promotions through the websites of the Cirebon and Brebes Regency Tourism and Culture Offices. Apart from that, the tourism distribution channel is also through WOM (word of mouth) or *getok tular* tourists who have visited provide recommendations to relatives and friends to visit.

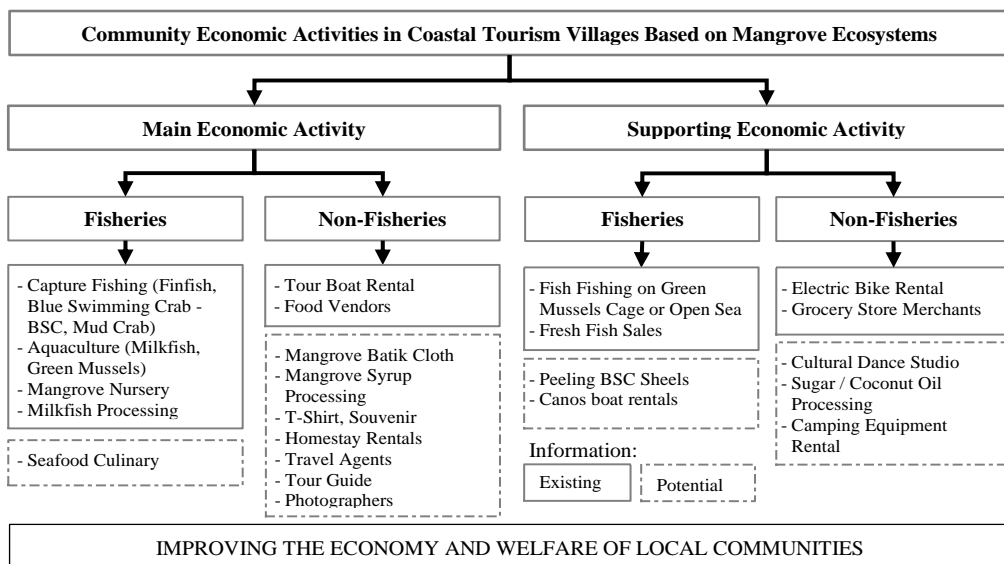
**Customer segments** are a strategy for grouping market targets that the industry wants to achieve. The customer segment element in the North Java Coastal Tourism Village itself applies the segmented type to natural lover tourists, consisting of domestic and foreign tourists.

**Cost Structure** is the costs incurred by the industry in driving its business model. The cost structure elements are tourism maintenance, fixed cost and operational activity cost. The total costs issued by *pokdarwis* in the first three months of operationalization of the Mundu Pesisir Coastal Tourism Village (January-March 2023) amounted to IDR 24,080,000. Fixed costs are used for purchasing sales equipment (stoves, tables), religious equipment (carpets, mukenas, prayer mats, sarongs), cleaning equipment (trash cans, plastic waste, brooms and dustpans), purchasing carpentry equipment (wood, boards, ropes, wire, thinner, brushes, paint, tarpaulin, saw, hammer) and clothes and hats for *Pokdarwis*. While variable costs are used for

honorariums for tourism managers (ticket sellers, guest companions, cleaners), electricity costs, water costs, fuel (gasoline) and printing new tickets.

**Revenue streams** are a picture of an industry generating income. The revenue streams element is obtained from usage fees and brokerage fees. Usage fees for entrance tickets are IDR 5,000 per person, parking fees are IDR 2,000 per motorbike unit and brokerage fees come from the state and regional budgets. Based on cash flow data from the *Pokdarwis* year 2023, the total income from entrance tickets to the Munda Pesisir Tourism Village from January to March 2023 is IDR 26,230,000, while the fishermen's group manages income from vehicle parking. Income from brokerage fees is used to develop tourist area infrastructure, both basic/main infrastructure and supporting infrastructure. The total income received for extending the Java North Coast mangrove tourism area was ± IDR 1.3 billion. These funds came from the Ministry of Marine Affairs and Fisheries, the Culture and Tourism Service, the Village Government, the Regional House of Representatives (Called *DPRD*) and the National Research and Innovation Agency. This income is different from the construction of Muara Munda Park, which comes from the Cimanuk Cisanggarung River Basin Center, Ministry of Public Works and Public Housing.

The community's economic activities in the North Java Coastal Tourism Village consist of main economic activities and supporting tourism. Economic activities are also differentiated according to their relationship to the mangrove ecosystem, consisting of fisheries and non-fisheries-based activities according to existing and potential conditions. In general, 10 types of existing community economic activities have been carried out by the community and 13 types of potential economic activities on local communities can pursue (Fig. 4). Previously, coastal communities' livelihood mainly-consisted of fish farmers and fishers. The existence of mangrove-based coastal tourism activities in villages can create diversification of existing and potential new livelihoods. The community can conduct economic activities based on the potential of the existing area and the future development of coastal tourism villages. Diversifying various livelihoods at the village level will positively impact improving the economy and welfare of local communities.



**Fig 4.** Existing and Potential Community Economic Activities in Mangrove Ecosystem-Based Coastal Tourism Villages  
 Source: Authors, 2023; *Swangjang & Kornpipat* [52]; *Abidin et al.* [4]; *Titisari et al.* [53]

### ***Leveraging and Inhibiting Factors for Mangrove Coastal Tourism Development***

The success of developing coastal tourism villages based on mangrove ecosystems cannot be separated from supporting and inhibiting factors that can be used as capital for future evaluation and improvement of management. This factor will be divided into four aspects: economic, social, environmental and infrastructure. The supporting and inhibiting factors will be described in more detail as follows.

#### ***a. Supporting factors***

Economic leverage in using mangrove ecosystems is an important focus in sustainable development efforts. Five main economic aspects affect economic growth and people's welfare: i) Utilization of mangroves into processed products. Local communities can utilize wood, leaves and mangrove plants to create value-added products such as handicrafts, building materials and other selling power in local and international markets. This not only supports local economic growth, but also provides incentives for mangrove conservation, ii) Digital economy in coastal tourism and fisheries. Technological developments enable efficient promotion and booking of coastal tourism and fishery activities. Using mangrove ecotourism and sustainable fisheries activities attracts tourists and creates a sustainable business ecosystem, iii) Utilization of community business. Community businesses in the fisheries and non-fisheries sectors can be as tourist attractions by displaying their daily lives, enriching tourist destinations' cultural dimension and authenticity, iv) Tourism as an alternative livelihood. Tourism can be an alternative livelihood for fishermen by involving them in tourist activities, v) Affordable access to tours. Ensuring ticket prices or tourist access fees are affordable will encourage wider participation, increase income from the tourism sector and maintain the sustainability of mangrove ecosystems. The factors mentioned have great potential in supporting local economic growth while maintaining environmental sustainability. Therefore, cooperation between the government, communities and businesses is very important in designing sustainable management strategies to maximize the existing economic potential, while maintaining the sustainability of mangrove ecosystems.

In the social aspect, sustainable mangrove resource utilization leverage consists of: i) Partnership between village government and private sector through Corporate Social Responsibility (CSR). These partnerships form strong coordination between the local community and the business sector. CSR practices enable private companies to participate in mangrove conservation and sustainable development efforts by allocating financial resources, human resources, knowledge, strengthens relationships among parties and generates concrete benefits for the community through improvement of public facilities, training and infrastructure, ii) Utilization of local wisdom and culture as a tourist attraction. This can make mangrove ecosystems more attractive and valuable for tourists. Mangrove destinations can provide authentic experiences to visitors with local culture and traditional knowledge. This practice also encourages the preservation of local people's culture and traditions while providing economic opportunities for the community, iii) Division of roles between community organizations and village governments. This division of roles can generate synergies in managing and utilizing mangrove resources. Village governments focus more on planning and development, while community organizations are more in-depth in implementing field activities, iv) Public awareness of ecology and the environment. This aspect is an important element in maintaining the sustainability of natural resources. The more people who realize the importance of and preserving mangrove ecosystems, the stronger the support for conservation and conservation efforts. Education initiatives and campaigns on the importance of mangrove ecosystems play an important role in building awareness, v) The proactive and leadership role played by community leaders. Voluntary attitudes and leadership shown by community leaders set an example for other community members. When community leaders are actively involved in mangrove conservation programs, it inspires and motivates other residents to participate. This voluntary attitude and leadership also create a culture of active participation in environmental conservation efforts. Close partnerships, utilization of local culture, thoughtful division of roles, increased ecological awareness and leadership of community leaders are important factors

capable of making a real contribution to local communities' sustainable development and well-being.

Five environmental leverages might be considered, namely: i) Procurement of clean water sources. The availability of sufficient fresh water is important for the sustainability of mangrove ecosystems and an opportunity to understand the importance of clean water for local communities and tourists, ii) Integration between mangroves and fisheries. Integrating mangrove ecosystems with fisheries as tourist attractions strengthens tourist attraction and raises awareness about ecosystem balance, iii) Experience in mangrove management. Local communities' in-depth knowledge of maintaining and managing mangrove ecosystems is important for sustainable management, iv) Normalization of major rivers. Using rivers as tourist trails reduces physical impacts on coastal ecosystems and provides educational opportunities about the importance of maintaining healthy rivers and coasts, v) The use of mangroves in the tourism industry. Using mangroves as a major attraction drives global awareness about nature conservation and provides incentives for local communities to safeguard the environment and develop sustainable economies. All these factors above play an important role in maintaining and optimizing the utilization of mangrove resources in a sustainable way, providing economic benefits to local communities and raising global awareness of the importance of nature conservation.

Infrastructure aspects play a crucial role in optimizing economic and ecological benefits. Five main factors in the infrastructure aspect have a major impact on the sustainable development of mangrove resource utilization: i) The availability of village markets as local economic centers. Village markets play an important role in supporting the economic sustainability of communities around mangroves by selling local products and regional specialties to tourists, ii) Construction of estuary facilities for tour boats. This facility provides a unique experience for tourists to explore the beauty of mangroves and coastal ecosystems through a comfortable and safe boat trip, iii) Accessibility from the north coast of Java (called *Pantura*) highway. Easy access from major highways increases tourist visits, both local and international, to mangrove destinations, iv) Establishment of tourist park facilities in estuary areas. Facilities such as recreation areas, information centers, restaurants and places of cultural performance create a more attractive environment for visitors, v) Utilization of trekking trails and supporting facilities. Trekking trails, ecological information boards and supporting facilities provide visitors with an educational and sustainable experience. With a focus on factors such as village markets, estuary facilities, accessibility, tourist parks and trekking trails, the utilization of mangrove resources can take place sustainably while providing diverse benefits to communities and the environment.

Governance plays a central role in optimizing the sustainable use of mangrove resources. Five important factors in governance encourage sustainable development of mangrove resource utilization: i) The existence of institutions that have been running. Institutions such as community organizations, *BUMDes* and tourism institutions are important in structured management, ii) District government support to village government. The district government's financial, technical and policy support provides a solid foundation for village governments in managing mangroves, iii) The existence of markets, *BUMDes*, *Pokdarwis* and *Pokwasm* following Village Regulations. This creates an inclusive and sustainable economic structure with direct economic benefits for local communities while maintaining environmental balance, iv) Inclusion of coastal areas as tourist destinations. Official recognition as a tourist destination brings access to support and promotion programs from district and provincial governments, v) Placement of coastal areas in the District Tourism Master Plan. This integration ensures that the utilization of mangrove resources is linked to the larger development vision and strategy. This governance factor provides a balance between utilizing mangrove resources and environmental conservation. Through ongoing institutions, government support, organized local economic structures, recognition as tourist destinations and integration in tourism master plans, the use of mangrove resources sustainably takes place, provides economic benefits to the community and preserves the valuable natural environment.

#### *b. Inhibiting Factors*

There are five main factors that need to be addressed to encourage the growth and welfare of tourism villages, namely: i) Harnessing the potential of the digital economy, ii) Utilization of the circular economy potential of mangroves, iii) Utilizing mangrove ecosystems to generate income through ecotourism, handicrafts and processed products with careful planning and strategy, iv) Identify existing tourist attractions, v) Synergy between existing economic sectors and the tourism industry, vi) Improved management of revenue from tourism. The development of sustainable tourism in villages requires serious attention to environmental aspects. Five environmental challenges need to be overcome so that the development of tourism villages can take place in line with the principles of nature conservation. These five challenges consist of: i) Utilizing mangroves with attention to the surrounding environment, ii) Regulation of river use well. As an integral part of mangrove ecosystems, rivers must be carefully regulated to prevent negative environmental impacts iii) Integration between two mangrove tourism points, iv) Diversification of mangrove management, v) Improved environmental hygiene. Concerning infrastructure, five inhibiting factors need to be overcome to achieve successful development. First, integration of village markets in tourist destinations. A well-organized village market can attract tourists, create an authentic experience and benefit the local community economically. Second, maintenance of river mouths. Protection from silting and garbage shipments is needed to maintain the aesthetics and ecology of tourist destinations. Third, the installation of clear directional signs. The right signs will help visitors explore tourist destinations comfortably. Fourth, planning of supporting facilities in estuaries and mangroves. Well-planned docks, rest areas and other facilities can increase visitors' comfort levels. Fifth, the availability of important supporting facilities (parking lots, culinary centers, information centers, garbage dumps and souvenir centers) are important components in the infrastructure of tourist destinations.

Effective governance is a key factor in the sustainable development of coastal tourism. Several inhibiting factors in governance need to be addressed for coastal tourism development to be successful, namely: i) Partnership models that have not been well planned. A strong partnership plan between the district government, village government and the private sector needs to be formulated so that coordination of coastal tourism management can run well, ii) Alignment with *RPJM-Desa*. Alignment of village development plans and coastal tourism development to have a strong footing and be integrated into the overall village development plan, iii) Clear leadership in management. The appointment of responsible institutions or individuals is necessary to improve the efficiency and effectiveness of tourism development, iv) Legalization of action plans. An action plan legalized and actualized by the village government will provide clear guidelines for implementing development v) Tourist village regulations. Making Village Regulations that specifically regulate the development of tourism villages is needed as a legal basis and regulation of coastal tourism management.

#### ***Development Strategy as Mangrove Coastal Ecotourism Village***

Mundu Pesisir Village and Kaliwlingi Village have the potential to be developed for ecotourism activities. Most of the tourism potential is in the form of natural tourism potential. However, this does not rule out the possibility of the emergence of artificial and cultural tourism and activities that can improve the economy of local communities. However, there is one risk that must be considered, namely the loss of coastal ecosystems. SWOT (Strength, Weakness, Opportunity, Threat) analysis to determine a strategy for developing a mangrove-based coastal ecotourism village includes identifying internal factors, external factors, Internal Factor Analysis Strategy (IFAS) and External Factor Analysis Strategy (EFAS), SWOT matrix, alternative strategy and development recommendations. Identifying internal and external factors, namely influential and prominent factors in the field, is the first stage carried out. This identification is obtained through questionnaires, data and interviews with related experts to be reflected as a whole and later classified according to type. The second stage is to calculate the rating obtained from the average assessment of the questionnaire and the weighting obtained from the expert assessments so that a final score will be obtained, which will be described in the SWOT matrix. The final stage is to plan alternative development strategies and provide appropriate recommendations for the two coastal tourism villages. The SWOT analysis results

combine strengths, weaknesses, opportunities and threats. Using this approach, four strategies for developing mangrove ecotourism on the north coast of Java have been formulated (Table 4).

**Table 4.** SWOT Analysis and Strategy for Mangrove Ecotourism Villages Development on the North Coast of Java

<b>INTERNAL FACTORS</b>	<b>STRENGTH (S)</b>	<b>WEAKNESS (W)</b>
	1) District government support for village government 2) The existence of markets, <i>BUMDes</i> , <i>Pokdarwis</i> and <i>Pokmaswas</i> , following Village Regulations 3) Inclusion of coastal areas as tourist destinations	1) Lack of tourism support facilities and financial support 2) Lack of clean water facilities and garbage/waste processing facilities 3) Lack of quality professional tourism village managers
<b>EXTERNAL FACTORS</b>		
<b>OPPORTUNITY (O)</b>	<b>S-O</b>	<b>W-O</b>
1) Utilization of the digital economy and circular economy 2) The synergy between existing economic sectors and the tourism industry 3) Increased need for natural tourism	1) Legality of management of mangrove coastal tourism villages (regulations and institutions) 2) Intensive and appropriate promotion of mangrove ecotourism destinations 3) Strengthening the role of stakeholders in developing mangrove ecotourism	1) Strengthening the skills and professionalism of managers of mangrove coastal tourism villages 2) Increased facilities and financial support 3) Provision of clean water and waste processing facilities
<b>THREAT (T)</b>	<b>S-T</b>	<b>W-T</b>
1) The existence of other similar tourist destinations 2) Coastline erosion due to tidal waves, tidal waves, estuary sedimentation 3) Converting mangroves into aquaculture land	1) Digging river estuary sedimentation, building barriers and strengthening anti-abrasion construction by the government/other stakeholders. 2) Improved tourist facilities	1) Improvement of attractions and basic tourist facilities 2) Increasing the skills and professionalism of managers and operators of mangrove coastal tourism villages

From the SWOT in Table 4, the group 1 strategy, namely S-O, is a strategy to utilize existing internal advantages to achieve existing external opportunities. Existing strengths continue to grow and develop and seize opportunity [8]. There are at least three recommended strategies, including: i) legality of management of mangrove coastal tourism villages (regulations and institutions), ii) intensive and appropriate promotion of mangrove ecotourism destinations, iii) strengthening the role of stakeholders in developing coastal tourism villages (mangrove ecotourism). The community-based tourism sustainability indicators include the three existing strategies: governance, economic and social [39]. Governance plays a central role in optimizing the sustainable use of mangrove resources. Governance is related to policy rules and policy stakeholders. Another view states that multi-sectoral tourism is a platform that provides a huge opportunity to encourage conservation efforts at a global level.

Meanwhile, on the other hand, most conservation experts see that a community-based approach is one solution to reducing the degradation of natural resources towards sustainability. The impact would be that ecotourism opportunities would become wide open as a bridge to create business and job opportunities for the community and efforts to preserve ecology. To realize sustainable development, three policy phases are needed: natural resource management, management of the impact of development on the environment and human resource development.

The second group of strategies (S-T) for utilizing existing internal advantages/strengths to avoid and overcome external business threats from outside. Existing strengths continue to be developed to be able to seize possible opportunities and at the same time face several things that pose a threat to the sustainability and development of the mangrove ecotourism village area. For this reason, this group has at least two strategies: i) digging river estuary sedimentation, building dams and strengthening anti-abrasion construction by the government/other stakeholders and ii) improving tourist facilities. These two strategies are to maintain the sustainability of mangrove-based coastal tourism villages from environmental and economic aspects. The development of facilities and infrastructure is crucial in tourism activities so that every visitor who comes gets convenience and comfort in travelling. Supporting facilities in

coastal tourism villages still need to be improved and developed for the comfort and convenience of visitors when travelling.

The mentality and creativity of mangrove tourism village managers need to be strengthened. Existing loyalty continues to be maintained to withstand pressure and threats to business development from outside parties. The role of stakeholders is an important aspect and pillar in the development of mangrove ecotourism. Tourism products become an attraction for visitors who come to enjoy ecotourism in a place. The ecotourism products offered are following the potential of natural resources, available facilities and accessibilities [7, 10, 54-55]. The third group of strategies (W-O) is a strategy to make improvements to existing internal weaknesses to seize opportunities that exist externally. Weaknesses are corrected and developed to capture existing opportunities [8]. The approach is to strengthen the weaknesses they have by getting opportunities that come from outside. For this reason, the strategies taken include: i) strengthening the skills and professionalism of managers of mangrove coastal tourism villages, ii) increasing facilities and financial support and iii) providing clean water and waste processing facilities. The three strategies fall into economic, social and environmental aspects in maintaining the sustainability of mangrove-based coastal tourism villages.

The fourth strategy group (W-T) is carried out by improving existing internal weaknesses to face and overcome threats that come from outside. Recommended strategies are: i) increasing basic tourist attractions and facilities and ii) increasing the skills and professionalism of managers and operators of mangrove coastal tourism villages. Three internal weaknesses are faced: the lack of tourism support facilities and financial support, the lack of clean water and waste/waste processing facilities and the lack of quality professional tourism village managers. These three weaknesses threaten coastal tourism villages' sustainability if they are not resolved immediately. Likewise, clean water facilities, especially toilets, are essential for tourists and village cleanliness for tourists' comfort when visiting. Coastal tourism village managers' technical and managerial capabilities towards ecotourism development are still feeble. For this reason, it is necessary to develop human resources regularly through training, internship assistance and mentoring.

## Conclusions

The transformation of mangrove conservation into ecotourism activities in the coastal villages of Mundu Pesisir and Kaliwlingi has formally entered the policy at the district level as a tourist destination. However, the village level has not yet technically established operational procedures. This technical factor still hinders the implementation of fishing, tourism, conservation and mangrove forest rehabilitation activities. On the other hand, the elaboration of existing activities (fishing, tourism, conservation) conducted by the community has provided economic benefits to some residents. The legitimacy of the management from the village and the community has also become a problem in managing all activities, including finances. This condition can cause social unrest, thus disrupting the sustainability of mangrove-based ecotourism in the village. Therefore, the legitimacy of village management and the involvement of broad community participation become significant issues that need immediate resolution.

To develop mangrove-based village tourism and ensure sustainability in these two villages, village governments and tourism managers must anticipate several factors that may pose challenges and optimize the existing potential. Generally, governance that considers local wisdom, the potential for regional economic diversification, the utilization of information technology, collaboration, inclusive participation and physical infrastructure are key factors. Also, payments for conservation management of coastal natural resources, local participation and increased research and awareness of the impacts of tourism on coastal biodiversity should be considered for coastal tourism development. These key factors will act as obstacles if their current existence is not rectified and maximized to support the mangrove forests in the two villages as ecotourism destinations and vice versa.

The development efforts for coastal village-based mangrove tourism involve several strategies, such as strengthening the legal and governance aspects of mangrove tourism villages



through regulations and relevant institutions, conducting intensive and targeted promotion of mangrove ecotourism, enhancing the role of stakeholders in the development of mangrove ecotourism, dredging sedimentation in river estuarie and constructing barriers and reinforcing anti-abrasion structures by the government or other stakeholders. Indeed, the village government needs to improve tourism facilities, strengthen the skills and professionalism of mangrove tourism village managers, increase support for facilities and finances and provide clean water facilities and waste management. Other measures involve enhancing tourist attractions and basic facilities and improving the skills and professionalism of managers and operators of mangrove tourism villages.

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### References

- [1] L. Arsyad, E. Satriawan, J.H. Mulyo, A. Fitriady, **Strategi Pembangunan Perdesaan Berbasis Lokal**, UPP STIM YKPN, Yogyakarta, 2018, p. 218.
- [2] M. Fattah, C.A. Intyas, H. Ruminar, M.E. Arif, *Evaluation of The Sustainability Status of the Bangsring Underwater With Indonesia's Coral Reef Ecosystem*, **Geojournal of Tourism and Geosites**, **49**(3), 2023, pp. 858-865. DOI: 10.30892/gtg.49302-1086.
- [3] R. Basuki, V. C. Wulandari, N. T. Suhesti, **Tourist Attraction Object Statistics 2021**, BPS-Statistics Indonesia, Jakarta, 2023, p. 77. Available online: <https://www.bps.go.id/publication/2023/05/18/f1511face611270ed812cd2d/statistik-objek-daya-tarik-wisata-2021.html> (accessed on January 30, 2024)
- [4] Z. Abidin, F.E. Nuryani, D.K. Saputra, M. Fattah, N. Harahab, A. Kusumawati, *Mangrove Potential Assesment for Determining Ecotourism Attraction and Strenghtening Destination Branding and Marketing: Gunung Pithing Mangrove Conservation Indonesia*, **Geojournal of Tourism and Geosites**, **47**(2), 2023, pp. 388-396. DOI: 10.30892/gtg.47204-1036.
- [5] \* \* \*, **Peta Mangrove Nasional Tahun 2021**. The Ministry of Environment and Forestry, Jakarta, 2021, p. 181. Available online: [https://www.researchgate.net/publication/358439377\\_mangrove\\_map\\_of\\_Indonesia](https://www.researchgate.net/publication/358439377_mangrove_map_of_Indonesia) (accessed on January 30, 2024)
- [6] B. Zhu, J. Liao, G. Shen, *Combining time series and land cover data for analyzing spatio-temporal changes in mangrove forests: A case study of Qinglangang Nature Reserve Hainan China*, **Ecological Indicators**, **131**, 2021, Article Number: 108135. DOI: 10.1016/j.ecolind.2021.108135.
- [7] P.R. Azzahra, E. Sumarga, A. Sholihah, *Mangrove ecotourism development at Karimunjawa National Park Indonesia*, **Biodiversitas**, **24**(8), 2023, pp. 4457-4468. DOI: 10.13057/biodiv/d240827.
- [8] I. Effendi, D. Yoswaty, I. Harahap, J. Jupendri, A. Andrizal, *Mangrove Conservation, Ecotourism, and Development Strategy in Bandar Bakau Dumai Indonesia*, **Journal of Environmental Management and Tourism**, **13**(5), 2022, pp. 1443-1452. DOI:10.14505/jemt.v13.5(61).19.
- [9] S. Zainal, I. Ilham, Nirzalin, Fakhurrrazi, R. Yunanda, *Rationality of Developing the Protected Mangrove Forests as Ecotourism*, **Revista de Gestao Social e Ambiental**, **17**(7), 2023, Article Number: S. Zainal, I. Ilham, Nirzalin, Fakhurrrazi, R. Yunanda, *Rationality of Developing the Protected Mangrove Forests as Ecotourism*, **Revista de Gestao Social e Ambiental**, **17**, 2023, Article Number: e03591. DOI: 10.24857/rgsa.v17n7-010.

- [10] I.G.B.R. Utama, I.W.R. Junaedi, N.P.D. Krismawintari, *The Market Potential and Sustainability Bali Ecotourism Destination*, **Journal of Law and Sustainable Development**, **11**(1), 2023, Article Number: e408. DOI: 10.37497/sdgs.v11i1.408.
- [11] M. Musaddun, K. Wakhidah, S.P. Dewi, N.S. Ristianti, *Bentuk Pengembangan Pariwisata Pesisir Berkelanjutan di Kabupaten Pekalongan*, **Jurnal Ruang: Jurnal Perencanaan Wilayah dan Kota**, **1**(2), 2013, pp. 261-270.
- [12] E.T. Byrd, *Stakeholders in Sustainable Tourism Development and their Roles: Applying Stakeholder Theory to Sustainable Tourism Development*, **Tourism Review**, **62**(2), 2007, pp. 6-13. DOI: 10.1108/16605370780000309.
- [13] I. Elgammal, *What if the local community is already well-off enough? Stakeholders' conflicts over sustainable tourism development in remote communities*, **Journal of Place Management and Development**, **15**(4), 2022, pp. 493-510. DOI: 10.1108/jpmd-02-2021-0020.
- [14] L.F. Nugraha, L. Sulistyowati, I. Setiawan, T.I. Noor, *Alternative Community-Based Village Development Strategies in Indonesia: Using Multicriteria Decision Analysis*, **Agriculture**, **12**(11), 2022, Article Number: 1903. DOI: 10.3390/agriculture12111903.
- [15] C. Tosun, *Limits to community participation in the tourism development process in developing countries*, **Tourism Management**, **21**(6), 2000, pp. 613-633. DOI: 10.1016/S0261-5177(00)00009-1.
- [16] M. Spalding, M. Kainuna, L. Collins, *World Atlas of Mangroves*, **Human Ecology**, **39**(2), 2011, pp. 107-109. DOI:10.1007/s10745-010-9366-7.
- [17] A.D. Setyawan, K. Winarno, P.C. Purnama, *REVIEW: Mangrove ecosystem in Java: 2. Restoration*, **Biodiversitas**, **5**(2), 2004, pp. 105-118. DOI: 10.13057/biodiv/d050212.
- [18] E. Mulyadi, O. Hendriyanto, N. Fitriani, *Konservasi Hutan Mangrove Sebagai Ekowisata*, **Jurnal Ilmiah Teknik Lingkungan**, **2**(1), 2010, pp. 51-58.
- [19] L. Hakim, D. Siswanto, N. Makagoshi, *Mangrove Conservation in East Java: The Ecotourism Development Perspectives*, **Journal of Tropical Life Science**, **7**(3), 2017, pp. 277-285. DOI: 10.11594/jtls.07.03.14.
- [20] H. Lumbessy, R. Joseph, P.H. Gosal, *Strategi Konservasi Ekosistem Mangrove Desa Mangega dan Desa Bajo sebagai Destinasi Ekowisata di Kabupaten Kepulauan Sula*, **Spasial**, **2**(3), 2015, pp. 192-200. DOI: 0.35793/sp.v2i3.10767.
- [22] Pramudji, *Hutan Mangrove di Indonesia: Peranan Permasalahan dan Pengelolaannya*, **Oseana**, **25**(1), 2000, pp. 13-20.
- [23] K. Rusdianti, S. Sunito, *Mangrove Forest Conservation and The Role of Local Community in Mangrove Ecosystems Rehabilitations*, **Sodality**, **6**(1), 2012, pp. 1-17. DOI: 10.22500/sodality.v6i1.5815.
- [24] E. T. Sihotang, H. Y. Yutanto, S. S. Suhartono, K. M. Budiana, D. E. Ekaningtyas, *Digital Marketing of Ecotourism Medokan Ayu Mangrove Botanical Gardens in Rungkut District, Surabaya, East Java*, **Indonesian Journal of Community Engagement**, **9**(1), 2023, pp. 30-37. DOI: 10.22146/jpkm.77400.
- [25] A. Purwoko, K. S. Hartini, M. Basyuni, M. D. Situmorang, *Community-Based Mangrove Tourism Object Development in Kampung Nipah, North Sumatra, Indonesia*, **Universal Journal of Agricultural Research**, **11**(2), 2023, pp. 241-254. DOI: 10.13189/ujar.2023.110203.
- [26] E. Firdaus, D. Haryono, M. Indra, I. Effendi, *Legal aspects and development of Bandar Bakau Dumai, Indonesia as a mangrove conservation and ecotourism area*, **AAFL Bioflux**, **16**(3), 2023, pp. 1448-1458.
- [27] J. Farley, D. Batker, I. De La Torre, T. Hudspeth, *Conserving mangrove ecosystems in the Philippines: Transcending disciplinary and institutional borders*, **Environmental Management**, **45**(1), 2010, pp. 39-51. DOI: 10.1007/s00267-009-9379-4.
- [28] C.A. Intyas, M. Fattah, T.N. Utami, *Mapping stakeholder's roles in Clungup Mangrove Conservation Tiga Warna Sendang Biru Ecotourism's Value Chain*, **Ecology Environment and Conservation**, **27**, 2021, pp. 54-58.

- [29] A.K. Bhowmik, R. Padmanaban, P. Cabral, M. M. Romeiras, *Global Mangrove Deforestation and Its Interacting Social-Ecological Drivers: A Systematic Review and Synthesis*, **Sustainability**, **14**(8), 2022, Article Number: 4433. DOI: 10.3390/su14084433.
- [30] Md. H. Iqbal, Md. E. Hossain, *Tourists' willingness to pay for restoration of Sundarbans Mangrove forest ecosystems: a contingent valuation modeling study*, **Environmental Development and Sustainability**, **25**(12), 2023, pp. 2443-2464. DOI: 10.1007/s10668-022-02140-w.
- [31] N. Khakhim, A. Musthofa, A. Wicaksono, W. Lazuardi, D. N. D. Pratama, M. A. Marfai, *Adaptation of mangrove ecotourism management to coastal environment changes in the special region of Yogyakarta*, **Journal of Environmental Management and Tourism**, **12**(3), 2021, pp. 754-765. DOI: 10.14505/jemt.12.3(51).14.
- [32] R. Sarkar, A. Sinha, *The village as a social entrepreneur: Balancing conservation and livelihoods*, **Tourism Management Perspectives**, **16**, 2015, pp. 100-106. DOI:10.1016/j.tmp.2015.07.006.
- [33] C. Koliouka, Z. Andreopoulou, *E-Tourism for Sustainable Development through Alternative Tourism Activities*, **Sustainability**, **15**(11), 2023, Article Number: 8485. DOI: 10.3390/su15118485.
- [34] W.L. Chin, N. Noorashid, *Communication, Leadership, and Community-based Tourism Empowerment in Brunei Darussalam*, **Advances in Southeast Asian Studies**, **15**(2), 2022, pp. 273-294. DOI: 10.14764/10.ASEAS-0075.
- [35] M. Kabil, S. Priatmoko, R. Magda, L.D. Dávid, *Blue economy and coastal tourism: A comprehensive visualization bibliometric analysis*, **Sustainability**, **13**(7), 2021, Article Number: 3650. DOI: 10.3390/su13073650.
- [36] R.A. Castanho, C. Santos, G. Couto, *Creative Tourism in Islands and Regional Sustainable Development: What Can We Learn from the Pilot Projects Implemented in the Azores Territory?* **Land**, **12**(2), 2023, Article Number: 498. DOI: 10.3390/land12020498.
- [37] T. Zheng, J. Yu, Q. Cheng, H. Pan, *The Influence Mechanism and Measurement of Tourists' Authenticity Perception on the Sustainable Development of Rural Tourism—A Study Based on the 10 Most Popular Rural Tourism Destinations in China*, **Sustainability**, **15**(2), 2023, Article Number: 1454; DOI: 10.3390/su15021454.
- [38] G. Usmonova, D. Alieva, C.J. León, *Yurt Invited: Combining Tourists and Stakeholders Perceptions of Sustainable Community-Based Tourism in Central Asia*, **Sustainability**, **14**(13), 2022, Article Number: 7540. DOI: 10.3390/su14137540.
- [39] T.B. Dangi, T. Jamal, *An integrated approach to 'sustainable community-based tourism*, **Sustainability**, **8**(5), 2016, Article Number: 475. DOI: 10.3390/su8050475.
- [40] P. Witchayakawin, Y.A. Aziz, A.S.B.B. Mahomed, N.H.B. Abdullah, *Comparing Stakeholder Participation In Community-Based Tourism (CBT) Examples From Thailand*, **Geojournal of Tourism and Geosites**, **41**(2), 2022, pp. 531-540. DOI: 10.30892/gtg.41226-860.
- [41] M.B. Miles, A.M. Huberman, J. Saldana, **Qualitative Data Analysis A Methods Sourcebook** (fourth edition), SAGE Publications Inc, Arizona State, 2019, p. 408.
- [42] M. Bagindo, B. Sanim, I.T. Saptono, *Model Bisnis Ekowisata di Taman Nasional Laut Bunaken dengan Pendekatan Business Model Canvas*, **Manajemen IKM**, **11**(1), 2016, pp. 80-88. DOI: 10.29244/mikm.11.1.80-88.
- [43] T. Singh, M.H. Slotkin, A.R. Vamosi, *Attitude towards ecotourism and environmental advocacy: Profiling the dimensions of sustainability*, **Journal of Vacation Marketing**, **13**(2), 2007, pp. 119-134. DOI: 10.1177/1356766707074736
- [44] A. Osterwalder, Y. Pigneur, **Business Model Generation Indonesia Edition**, PT. Elex Media Komputindo, Jakarta, 2013.
- [45] I. Athia, E. Saraswati, A. Normaladewi, *Penerapan Business Model Canvas (BMC) untuk Mendorong Mindset Kewirausahaan di Kalangan Mahasiswa Universitas Islam Malang*, **Jurnal Ketahanan Pangan**, **2**(1), 2018, pp. 66-75.

- [46] M. Diaudin, D. Nasikh, *Business Model Canvas; Perencanaan Strategi Pengembangan Agrowisata Belimbing Karang Sari Kota Blitar di Masa Pandemi Covid-19*, **Media Wisata**, **20**(1), 2022, pp. 88–101. DOI: 10.36276/mws.v20i1.326.
- [47] F. Rangkuti, **Analisis Swot: Teknik Membedah Kasus Bisnis**, Gramedia Pustaka Utama, Jakarta, 2013.
- [48] W.R. Scott, **Institutions and Organizations** (second edition). Sage Publications Inc, Stanford University, 2008, p. 360.
- [49] \* \* \*, **Regulation of Ministry of Tourism and Creative Economy Number 9** of 2020 Concerning tourism, Ministry of Tourism and Creative Economy. 2009.
- [50] \* \* \*, **Regulation of Ministry of Community and Village Empowerment Number 11** of 2021 concerning Village-Owned Enterprises (BUMDes), Ministry of Community and Village Empowerment. 2021.
- [51] E. Giesen, E. Riddleberger, R. Christner, R. Bell, *When and how to innovate your business model*, **Strategy and Leadership**, **38**(4), 2010, pp. 17-26. DOI: 10.1108/10878571011059700.
- [52] K. Swangjang, P. Kornpiphat, *Does ecotourism in a Mangrove area at Klong Kone, Thailand, conform to sustainable tourism? A case study using SWOT and DPSIR*, **Environment, Development and Sustainability**, **23**, 2021, pp. 15960-15985. DOI: 10.1007/s10668-021-01313-3.
- [53] E.Y. Titisari, S. Azizah, S. Kurniawan, A.M. Ridjal, R. Yuniarti, *Aplikasi Konsep Eco-Culture dalam Pengembangan Kampung Wisata Buah Baran Bercahaya*, **Review of Urbanism and Architectural Studies**, **20**(1), 2022, pp. 109-117. DOI: 10.21776/ub.ruas.2022.020.01.11.
- [54] P.B. Cobbinah, *Contextualising the meaning of ecotourism*, **Tourism Management Perspectives**, **16**, 2015, pp. 179-189. DOI: 10.1016/j.tmp.2015.07.015.
- [55] L. Arlym, D. Hermon, *Strategy of ecotourism development in Pariaman City*, **IOP Conference Series: Earth and Environmental Science - Institute of Physics Publishing**, 15 – 16 November 2018, West Sumatera, Indonesia, p. 6.

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