

Development Strategy for Community-Based Coastal Ecotourism in Wondiboy, Teluk Wondama Regency, Indonesia

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ABSTRACT: The Wondiboy coastal area in Teluk Wondama Regency, West Papua, contains bay landscapes, mangroves, sago forests, marine activities, cultural and religious assets, and coastal livelihoods that provide a strong basis for ecotourism. However, these assets have not been matched by balanced destination readiness, institutional capacity, basic services, and spatial control. This study analyzes tourism potential and destination readiness, identifies major development constraints, and formulates a community-based coastal ecotourism strategy within a sustainable regional development framework. A convergent mixed-methods design was used, combining questionnaires from 75 visitors and 94 local residents with in-depth interviews, field observations, expert assessments, and reviews of spatial and tourism planning documents. Internal conditions were diagnosed using the 6A destination framework, while IFAS-EFAS and SWOT were used to formulate strategies that were subsequently screened through Integrated Coastal Zone Management, Community-Based Tourism, carrying capacity, coastal resilience, and policy consistency. Visitor scores showed high attraction (4.17), moderate accessibility (2.93), accommodation (3.22), amenities (2.69), and activities (3.08), but very low ancillary services (1.51), producing an overall mean of 2.93. The SWOT coordinates (+0.55; +1.03) place Wondiboy in Quadrant I, yet the narrow internal advantage indicates that Weakness-Opportunity measures should precede expansion. The recommended sequence is institutional and human-resource strengthening, basic and safety infrastructure, controlled ecotourism product development and zoning, followed by gradual market connectivity and green investment. The study shows that growth-oriented positioning does not imply immediate promotion; destination readiness must first reach a minimum operational threshold.

KEYWORDS: Coastal ecotourism, community-based tourism, destination readiness, integrated coastal zone management, regional development

INTRODUCTION

Coastal areas are land-sea interfaces in which ecological functions, settlements, transport, fisheries, conservation, and tourism operate simultaneously. Tourism development in such areas cannot therefore be reduced to promotion or the addition of attractions. Decisions concerning access, facilities, location, visitor intensity, and investment directly affect ecosystems, safety, local livelihoods, and regional service structures. Integrated coastal management requires coordination across sectors and levels of government, supported by clear institutional arrangements and cooperation mechanisms [1]. A source-to-sea perspective further shows that coastal problems cross administrative and sectoral boundaries and must be understood through connections among upstream-downstream processes, land-sea interactions, and multiple governance scales [2]. For tourism destinations, this perspective is important because attractiveness alone cannot compensate for weak services, fragmented management, or uncontrolled spatial pressure.

Teluk Wondama Regency in West Papua Province has coastal and island characteristics that create opportunities for marine tourism and ecotourism as instruments of local economic development. The Wondiboy coastal area contains bay scenery, beaches, mangroves, sago forests, marine activities, local culture, religious sites, and livelihoods closely connected to coastal resources. Its proximity to Cenderawasih Bay National Park also creates opportunities for conservation-oriented destination networks. Yet tourism resources do not automatically form a viable destination. Wider regional benefits are more likely when attractions are connected to access, facilities, local enterprises, management organizations, safety standards, and mechanisms that retain value within



communities. Community-based tourism literature emphasizes that local ownership, capacity building, and meaningful participation in decision-making are central to sustainable welfare outcomes [3], while recent work also links community-based tourism with poverty reduction and decent work when local actors occupy real positions in the tourism value chain [4].

The central development problem in Wondiboy is the imbalance between strong resource potential and uneven destination readiness. Field evidence indicates that visitors and residents recognize the area's natural and cultural attractions, but information services, guiding, basic amenities, waste management, safety standards, and destination institutions are less developed. This imbalance is particularly important because the coastal area is exposed to disaster risk, climate-related pressures, environmental degradation, and transport uncertainty. In ecologically sensitive destinations, growth without controls may reduce both environmental quality and visitor experience. Social-ecological carrying capacity provides an important boundary for small-island and coastal tourism development [5], while tourism carrying capacity should be treated as a management instrument rather than merely a numerical limit on visitors [6].

The study area also presents a distinctive regional-planning issue. Ramiki Village is administratively located in Wasior District, but geographically and functionally it is connected to the Wondiboy coastal corridor through shoreline continuity, access networks, socio-economic activities, and service relationships with Kaibi, Kabouw, Wondiboy, Issui, Wasior, and Rasiei. A rigid administrative boundary would therefore fragment ecological processes and tourism service networks. This study uses a functional-area perspective: Ramiki is the principal field site, while Wondiboy is interpreted as a coastal corridor linked to the Wasior-Rasiei service center. This approach is consistent with integrated coastal zone management, which seeks to connect ecological, social, institutional, and spatial considerations in coastal ecotourism planning [7].

Previous studies provide important but partial foundations. Research in Teluk Wondama has already shown the importance of community participation in coastal ecotourism [8]. Tourism-resilience studies have expanded the discussion from recovery to adaptation, learning, and transformation [9], while empirical work in coastal Indonesia demonstrates that environmental, economic, social, and institutional capacities must be strengthened together [10]. Marine-destination research also identifies social capital, local knowledge, and organizational capacity as key components of community resilience [11]. Collaborative governance has been associated with stronger tourism resilience [12], and recent evidence suggests that digitalization can enhance the welfare effects of marine ecotourism when it is linked to local economic empowerment [13]. Nevertheless, these strands are rarely integrated into a single decision sequence that moves from internal destination readiness to regional opportunities, strategic positioning, spatial control, and implementation priorities.

This study addresses three research gaps. First, coastal-tourism SWOT analyses often mix internal and external factors without a clear evidence trail; this study derives Strengths and Weaknesses from the 6A destination diagnosis and field evidence, while Opportunities and Threats are derived from regional governance, policy, connectivity, investment, and risk conditions. Second, SWOT recommendations are frequently treated as final outputs, even though coastal destinations require further screening for carrying capacity, community control, disaster resilience, and spatial compatibility. Third, functional tourism areas that cross village or district boundaries remain underused as planning units even when ecosystems, access, and services operate as networks. Accordingly, this study aims to: [1] assess tourism potential and destination readiness in the Wondiboy coastal area; [2] identify the principal constraints on development; and [3] formulate a community-based coastal ecotourism strategy that integrates conservation, education, local empowerment, spatial management, and sustainable regional development.

LITERATURE REVIEW

Destination Readiness and the 6A Framework

The 6A framework is used to determine whether a tourism area functions as a destination rather than merely possessing attractive resources. The destination concept proposed by Buhalis emphasizes the interdependence of attractions, access, facilities, activities, packages, and supporting services [14]. This study applies an adapted 6A structure that separates Accommodation from Amenities: Attraction, Accessibility, Accommodation, Amenities, Activities, and Ancillary Services. The distinction is relevant to Wondiboy because lodging capacity, basic facilities, and institutional services represent different operational problems. Community-based destination research has also shown that a 6A diagnosis can identify concrete management needs rather than simply catalogue attractions [15]. In this study, a high attraction score is not interpreted as overall readiness when access, safety, information, product organization, or management capacity remain weak.



From a regional-development perspective, each 6A component corresponds to a service function. Accessibility reflects connectivity; accommodation and amenities reflect service and infrastructure provision; activities show the capacity to transform resources into marketable experiences; and ancillary services reflect information, organization, regulation, guiding, booking, and stakeholder networks. Imbalances among these components can therefore be read as regional service gaps. Such a diagnosis is more useful for planning than counting attractions or visits alone because it identifies bottlenecks that prevent natural and cultural assets from being converted into local economic and social benefits.

Integrated Coastal Management, Carrying Capacity, and Resilience

Integrated Coastal Zone Management (ICZM) is used as a strategic filter so that tourism is not planned separately from conservation, settlements, fisheries, transport, disaster risk, and community livelihoods. Governance research emphasizes institutional structure, stakeholder involvement, coordination, and cooperation as core conditions of successful coastal management [1]. Multi-scale and source-to-sea thinking further requires decisions at the tourism-site level to be compatible with wider ecological processes and government responsibilities [2]. In practical ecotourism planning, integration of ecological, social, institutional, and spatial dimensions can reduce sectoral fragmentation and support long-term destination management [7].

Carrying capacity complements ICZM by establishing limits to acceptable use. In small-island tourism, carrying capacity should be understood as a social-ecological system property rather than a purely geometric calculation [5]. Tourism carrying capacity is therefore most useful when it informs management of facilities, waste, ecosystem pressure, safety, and visitor experience [6]. This study uses an indicative Regional Carrying Capacity calculation as an initial planning threshold but does not interpret the result as a final visitor quota without ecological verification, facility assessment, and community acceptance.

Resilience adds a temporal dimension by asking whether a destination can maintain or recover its functions under shocks. Tourism-resilience scholarship increasingly emphasizes adaptation, learning, and transformation rather than simple return to a pre-shock condition [9]. Evidence from coastal Indonesian destinations similarly indicates that environmental, economic, social, and institutional capacities must be strengthened together [10]. For Wondiboy, resilience involves safe access, evacuation, institutional continuity, ecosystem protection, diversified local products, and the ability to adapt to disaster, climate, transport, and market disruptions.

Community-Based Tourism and Regional Development

Community-Based Tourism (CBT) is used to evaluate who participates in decisions, who owns or manages tourism services, and who receives benefits. CBT is not equivalent to symbolic participation. It requires local organizations, ownership opportunities, capacity building, and benefit-sharing mechanisms that can be monitored [3,4]. In marine destinations, social capital, local knowledge, and organizational capacity also contribute to resilience [11], while collaborative arrangements among government, communities, and businesses can strengthen destination capacity under pressure [12].

The implication for Wondiboy is that digital promotion should not precede product and institutional readiness. Digitalization can strengthen local enterprises and marine-ecotourism benefits [13], but its contribution will remain limited if visitors cannot obtain reliable information, guides are unavailable, facilities are inadequate, or service standards do not exist. CBT is therefore operationalized through inter-village management, local guiding, homestays, culinary activities, small enterprises, environmental management, and transparent benefit distribution. Tourism is positioned as diversification of the coastal economy rather than a complete replacement for existing livelihoods.

Previous Studies and Research Position

The literature shows a shift from tourism-potential inventories toward capacity, resilience, integrated governance, and benefit distribution. Table 1 summarizes the principal studies used to position this research. The contribution of the present study is not a new stand-alone theory, but an analytical sequence in which the 6A framework provides an internal diagnosis, IFAS-EFAS and SWOT formulate strategic options, ICZM/CBT/carrying capacity/resilience screen those options, and the functional-area approach defines the spatial scale of intervention. The Tourism Area Life Cycle (TALC) is used interpretively to understand development stage; previous Indonesian research demonstrates that destination-stage assessment can help determine appropriate interventions [16].

Table 1. Previous Studies and the Position of the Wondiboy Research

Study	Focus	Main Finding	Position/Gap for Wondiboy
Adrianto et al. (2021)	Social-ecological carrying capacity for small-island tourism	Capacity depends on interactions among ecology, communities, and governance.	Provides carrying-capacity foundation; does not integrate 6A diagnosis with regional strategy.
Auri et al. (2022)	Community participation in Teluk Wondama ecotourism	Community support and local institutions are important to ecotourism.	Highly relevant context, but does not integrate 6A, zoning, and resilience.
Wang et al. (2022)	Tourism-destination resilience research	Resilience includes adaptation, learning, and response to disturbance.	Provides resilience basis; empirical application in West Papua remains limited.
Haribudiman et al. (2023)	Carrying capacity in sustainable destinations	Carrying capacity can guide development control.	Needs translation into site-level facilities and operational management.
Michels-Brito et al. (2023)	Source-to-sea and coastal management	Coastal management requires cross-scale and cross-sector integration.	Not specifically focused on destination services or visitor experience.
Reza et al. (2024)	ICZM for coastal ecotourism	Ecological, social, spatial, and institutional integration supports sustainability.	Internal and external evidence sources in strategy formulation need clearer separation.
Junaid et al. (2024)	Community resilience in marine tourism	Social capital, knowledge, and organizations support adaptation.	Needs linkage with destination-service readiness and spatial policy.
Basyar et al. (2025)	Multi-stakeholder governance and tourism resilience	Collaborative governance strengthens resilience.	Requires adaptation to village, customary, and coastal institutions.
Awfa et al. (2025)	Coastal destination resilience	Environmental, economic, social, and institutional dimensions must be strengthened together.	Does not emphasize sequencing interventions from readiness diagnosis.
Walewangko et al. (2026)	SME digitalization and marine ecotourism	Local economic empowerment mediates tourism and digitalization benefits.	Promotion should follow adequate product and service readiness.

Source: Compiled by the authors from the literature, 2026.

MATERIALS AND METHODS

Research Design and Study Area

This research employed a convergent mixed-methods design. Quantitative and qualitative data were collected during the same research period, analyzed according to their respective functions, and integrated during interpretation and strategy formulation. The design was selected because destination readiness requires structured perception measurements, whereas the causes of weaknesses, institutional conditions, regional risks, and strategic feasibility cannot be explained by scores alone. The spatial unit of analysis was the Wondiboy coastal area as a functional corridor. Ramiki Village served as the principal field site even though it is administratively part of Wasior District, because it has shoreline, access, socio-economic, and service linkages with villages in Wondiboy District.

Quantitative data were obtained from 75 visitors and 94 local residents. Visitors were selected using accidental sampling among people who had directly experienced the study area. Community respondents were allocated to represent the core villages and



supporting settlements: 90 respondents came from Ramiki, Issui, Kaibi, Kabouw, and Wondiboy, while four contextual respondents came from Iriati and Manopi. Qualitative interpretation and strategic assessment were supported by one tourism-substance expert and four regional assessors representing environmental management, disaster issues, regional planning, and conservation/community empowerment. Expert assessors were selected purposively based on their knowledge relevance.

Data Collection and Instruments

Data collection used Likert-scale questionnaires, field observation, in-depth interviews, documentation, and planning-document review. Secondary sources included Teluk Wondama regional statistics [18], the regency spatial plan [19], the detailed spatial plan for the Rasiei urban area [20], and the Teluk Wondama Tourism Development Master Plan 2025-2045 [21]. Visitor questionnaires primarily measured actual experience of the 6A components and visible resilience conditions, while community questionnaires examined perceived conditions, benefits, local roles, readiness, and development needs. Interviews were used to identify root causes, examine discrepancies between respondent groups, and assess implementation sequencing.

Item validity for the 6A instrument was assessed using Pearson item-total correlation. At a 5% significance level, the critical r -values were 0.227 for visitors ($df=73$) and 0.203 for residents ($df=92$). Twenty of 38 visitor 6A items and 16 of 24 community 6A items were valid. Cronbach's Alpha for the visitor 6A scale was 0.559, while the community 6A scale reached 0.742. The lower visitor alpha was explicitly treated as an interpretive limitation: visitor scores were used descriptively and were not allowed to determine strategic factors on their own. When additional dimensions were included, overall reliability increased to 0.740 for visitors and 0.892 for residents. Triangulation among visitors, residents, observation, interviews, documents, and expert assessment was therefore substantive to the analytical design.

Data Analysis

Analysis proceeded in five stages. First, 6A scores were interpreted using the following intervals: 1.00-1.80 very low; 1.81-2.60 low; 2.61-3.40 moderate; 3.41-4.20 high; and 4.21-5.00 very high. Second, constraints were identified from low scores, gaps between respondent groups, observation, and interviews. Third, Strengths and Weaknesses were derived from internal 6A conditions and field evidence, whereas Opportunities and Threats were derived from regional governance and regional analysis. These factors were weighted and rated in IFAS-EFAS matrices and then positioned within SWOT. The deliberate separation of evidence sources was intended to make the strategic logic traceable.

Fourth, SO, WO, ST, and WT alternatives were screened using ICZM, CBT, coastal resilience, policy consistency, and destination-development stage. Fifth, spatial directions were evaluated using conceptual zoning and Regional Carrying Capacity. The calculation followed the marine-ecotourism carrying-capacity formulation developed by Yulianda [17]:

$$DDK = K \times (Lp/Lt) \times (Wt/Wp)$$

where K is the ecological potential of visitors, Lp is the usable area or route length, Lt is the area unit required for an activity, Wt is available operational time, and Wp is the average activity duration. Because Lp remained indicative, the calculated capacity was interpreted as a preliminary planning threshold rather than a final visitor quota. Inferential analysis was not used to generalize preferences to the entire tourism market because the visitor sample was non-probabilistic and all surveyed visitors resided in Teluk Wondama Regency.

RESULTS AND DISCUSSION

Current Market and Destination Development Stage

The actual visitor market provides an important indication of Wondiboy's development stage. All visitors in the sample resided in Teluk Wondama Regency; 57.3% had visited more than three times, 66.7% came for recreation, 78.7% stayed for less than one day, and none stayed overnight. At the time of the survey, Wondiboy therefore functioned primarily as a local recreation space rather than a stay-over destination. This matters for strategy because marketing should not be based on assumptions about national or international demand that have not yet been tested. Improving the local visitor experience, half-day or one-day products, and basic services is more appropriate than broad promotional campaigns at the current stage.

In TALC terms, repeated local visitation, limited facilities, and immature destination institutions indicate an early development stage. Destination-stage research suggests that intervention types should correspond to the stage of development [16]. For Wondiboy, early success should not be measured by a rapid increase in visitor numbers but by whether the area can establish a

functioning management organization, service standards, safety procedures, purchasable products, and spatial-protection mechanisms. Promotion ahead of these foundations could intensify pressure on already-limited amenities and ecosystems.

Uneven Destination Readiness Based on the 6A Framework

The 6A scores reveal a clear readiness imbalance. Visitors rated Attraction at 4.17 (high), Accessibility at 2.93, Accommodation at 3.22, Amenities at 2.69, and Activities at 3.08 (all moderate), while Ancillary Services scored only 1.51 (very low). The overall visitor mean was 2.93, placing destination readiness in the moderate category. Residents rated Attraction 4.49, Accessibility 3.06, Accommodation 3.27, Amenities 2.27, Activities 4.33, and Ancillary Services 4.40, producing an average of 3.64. The largest differences were in Activities and Ancillary Services.

Table 2. Summary of 6A Destination Scores

Component	Visitors	Category	Residents	Category
Attraction	4.17	High	4.49	Very high
Accessibility	2.93	Moderate	3.06	Moderate
Accommodation	3.22	Moderate	3.27	Moderate
Amenities	2.69	Moderate	2.27	Low
Activities	3.08	Moderate	4.33	Very high
Ancillary Services	1.51	Very low	4.40	Very high
6A Mean	2.93	Moderate	3.64	High

Source: Primary data analysis, 2026.

The high attraction score confirms that Wondiboy's principal problem is not a lack of tourism resources. Bay and beach scenery, mangroves, sago forests, marine activities, culture, and religious assets provide a differentiated product base. In a 6A logic, however, attraction creates economic value only when it can be converted into safe, interpretable, scheduled, and serviced activities. The moderate visitor score for Activities indicates that resources have not yet been fully transformed into structured visitor experiences. This supports the use of the 6A framework as a diagnostic chain rather than an attraction inventory [15].

Ancillary Services are the most critical bottleneck. The visitor score of 1.51 indicates that destination information, promotion, guiding, management organization, booking mechanisms, and supporting services are not yet strongly experienced by visitors. By contrast, the resident score of 4.40 reflects a combination of perceived need, social willingness, and expectations regarding future local roles. These scores should not be mechanically averaged because the two groups evaluate different realities: visitors assess services actually encountered, whereas residents also evaluate potential participation. Strategically, the gap represents both an opportunity and a warning. Community support is a valuable resource, but it must be converted into functioning services through clear organizations, role distribution, training, and operational standards.

Amenities also require immediate attention. Visitor and resident scores were 2.69 and 2.27, respectively. Field observation and interviews identified shortages in toilets, clean water, waste management, information points, signage, safety equipment, and emergency facilities. This finding is consistent with carrying-capacity literature: the ability to receive visitors depends not only on physical space but also on the capacity of facilities and management systems to absorb use without degrading environmental quality or visitor experience [5,6]. Consequently, any increase in visitation should be conditional on sanitation, waste, safety, and site-monitoring capacity.

Additional dimensions strengthened this diagnosis. Visitors rated environmental resilience at 3.63 (high), safety/preparedness at 2.75 (moderate), and satisfaction/loyalty at 3.99 (high). Residents rated environment and carrying capacity at 4.12 (high), economic conditions at 3.98 (high), and social-institutional participation at 4.45 (very high), but infrastructure and mitigation at only 2.40 (low). The pattern indicates that natural experience and social capital are comparatively strong, while resilient

infrastructure and preparedness lag behind. This is consistent with research identifying community capacity and institutional-infrastructure readiness as inseparable components of sustainable marine tourism [10,11].

Strategic Position: Quadrant I with Internal Improvement as the First Step

The IFAS matrix produced a Strengths subtotal of 1.63 and a Weaknesses subtotal of 1.08, yielding an internal coordinate (X) of +0.55. The positive value means that internal strengths exceed weaknesses, but only by a narrow margin. Strengths include natural-cultural attractions, existing basic access, proximity to service centers, local accommodation potential, local ownership, and position within the Wasior-Wondiboy destination network. Weaknesses are concentrated in ancillary services, institutions, facilities and safety, activity/guiding readiness, digital promotion, human-resource capacity, and waste management.

The EFAS matrix produced an Opportunities subtotal of 1.8576 and a Threats subtotal of 0.8317, resulting in $Y = +1.0259$, rounded to +1.03. Opportunities arise from tourism and spatial-planning policy, regional connectivity, spatial control, conservation networks, programs and investment, and cooperation among destinations. Threats include disaster risk, climate change, environmental pressure, limited regional fiscal capacity, socio-economic constraints, and transport instability. The coordinates (+0.55; +1.03) position Wondiboy in Quadrant I, which conventionally suggests a Strengths-Opportunities growth strategy.

Table 3. IFAS-EFAS Summary and Strategic Position

Component	Value	Interpretation
IFAS - Strengths	1.63	Natural-cultural attractions, basic access, service-center proximity, local ownership, destination network.
IFAS - Weaknesses	1.08	Ancillary services, institutions, facilities/safety, guiding, promotion, human resources, waste management.
Internal coordinate (X)	+0.55	Positive but relatively narrow internal advantage.
EFAS - Opportunities	1.8576	Policy support, regional connectivity, spatial control, conservation networks, programs/investment, cooperation.
EFAS - Threats	0.8317	Disaster, climate change, environmental pressure, fiscal constraints, transport instability.
External coordinate (Y)	+1.03	External opportunities considerably exceed threats.

Source: IFAS-EFAS analysis and expert assessment, 2026.

A mechanical reading of the quadrant would, however, be misleading. The internal coordinate of +0.55 is much narrower than the external coordinate of +1.03. Regional opportunities are comparatively strong, but the destination does not yet possess sufficiently robust internal systems to capture them. Expert assessment therefore placed Weakness-Opportunity (WO) measures first: policy support, networks, investment, and regional programs should initially be used to strengthen institutions, human resources, facilities, safety, information access, and basic services. The difference between a Quadrant I position and a WO implementation priority is not a contradiction. The quadrant answers where growth opportunities exist; expert sequencing answers what must be strengthened before those opportunities can be captured.

This distinction also provides a methodological criticism of simplified SWOT use. When all factors are mixed without a clear evidence source, high opportunity scores can drive recommendations toward aggressive promotion even when destination services remain weak. In this study, Strengths and Weaknesses are restricted to traceable internal conditions, while Opportunities and Threats are derived from the regional context. The structure prevents weak services from being obscured by optimistic external opportunities and makes strategic recommendations easier to audit by policy makers.

Priority Strategies and Implementation Sequence

The integrated analysis produced four priority groups. The first is institutional and human-resource strengthening. Local government, district and village governments, customary communities, tourism-awareness groups or destination organizations,

enterprises, and conservation actors require a working forum with clear responsibilities. Operational priorities include guide training, basic hospitality, water-tourism safety, interpretation of mangroves and sago landscapes, homestay management, business administration, and visitor recording. This direction is consistent with CBT because residents are positioned as managers and service owners rather than only as labor [3,4]. Collaborative-governance evidence similarly indicates that destination resilience is stronger when stakeholder relationships are institutionalized rather than informal [12].

The second priority is basic facilities and safety. Interventions include sanitation, clean water, waste systems, signage, information points, first-aid facilities, safe landing places, evacuation routes, and emergency procedures. These elements may appear less marketable than landmark attractions, yet the results show that amenities and mitigation are practical bottlenecks. In a hazard-prone coastal setting, infrastructure quality must be evaluated for both normal service and performance during disturbance. Facility location should therefore consider coastal setbacks, hazard exposure, evacuation flow, emergency access, and the capacity of local managers to maintain the infrastructure.

The third priority is controlled ecotourism-product development. Dispersed resources need to be assembled into packages with a clear visitor sequence, duration, guide, safety standard, price, and conservation message. Potential products include mangrove and sago-forest interpretation, small-scale marine activities, cultural and religious interpretation, coastal cuisine, and environmental education. Cross-village products are preferable so that economic benefits are not concentrated at a single site. Wasior-Rasiei can function as the access and service hub, while Ramiki-Wondiboy functions as the experience corridor, creating regional linkages among transport, small enterprises, homestays, food services, guiding, and conservation.

The fourth priority is market connectivity and promotion, implemented only after minimum readiness indicators have been achieved. Digitalization can improve the benefits of marine ecotourism and local enterprises [13], but in Wondiboy it should follow the availability of reliable information, purchasable products, schedules, management contacts, and basic service standards. Promotion that precedes readiness can create visitor expectations that the destination cannot meet. Since the actual market is still local, expansion should be gradual: strengthen the Teluk Wondama market first, then test West Papua and other domestic markets, followed by specialized conservation or interest-based segments.

Table 4. Priority Strategy and Phased Implementation

Priority	Stage	Implementation Direction
1. Institutions and human resources	Short term	Inter-village management forum, role distribution, guide/hospitality/safety training, business administration.
2. Basic facilities and safety	Short term	Clean water, toilets, sanitation, waste management, signage, information, first aid, safe landing, evacuation.
3. Ecotourism products and spatial control	Medium term	Mangrove-sago, marine, cultural/religious packages; zoning; conservation SOPs; carrying-capacity monitoring.
4. Market connectivity and green investment	Gradual/conditional	Wasior-Rasiei-Cenderawasih Bay network, digital promotion, SME partnerships, market expansion after readiness thresholds.

Source: Integration of SWOT, ICZM, CBT, carrying capacity, resilience, and expert assessment, 2026.

Spatial Direction, Zoning, and Carrying Capacity

ICZM screening produced six conceptual operational zones: a core conservation zone, limited ecotourism zone, tourism-service zone, accommodation and enterprise zone, cultural-religious zone, and buffer/mitigation zone. These categories are not proposed as a new legal zoning system; they are operational directions that must be reconciled with the regency spatial plan, detailed spatial plan, customary rights, ecosystem conditions, and site verification [19,20]. The core conservation zone should accommodate only very low-impact activities; the limited ecotourism zone allows controlled use; the tourism-service zone contains basic facilities; the accommodation-enterprise zone places homestays and local businesses in safer spaces; the cultural-religious zone protects local values; and the buffer/mitigation zone integrates ecological protection with safety functions.



The indicative carrying-capacity calculation produced 40 persons per day for beach activities, 40 persons per day for mangrove/sago routes, and 20 persons per day for snorkeling, equivalent to approximately 100 activity visits per day when the three activities operate in separate spaces under the technical assumptions used. These values must be interpreted cautiously because the usable-area parameter remains indicative. Final limits require more detailed field measurement, ecological-condition assessment, habitat sensitivity, facility capacity, safety arrangements, and social acceptance. This interpretation follows the social-ecological view that carrying capacity is a property of the destination system rather than a purely physical formula [5].

ICZM also connects zoning with risk. Disaster and climate-change threats in EFAS mean that new facilities should not be located solely on the basis of proximity to attractions. Development must consider coastal setbacks, hazard-prone areas, evacuation routes, emergency access, and recoverability. Cross-scale coastal management further implies that site decisions in Ramiki should remain consistent with regency policy, the Wasior-Rasiei service network, and the wider conservation landscape [2]. The tourism master plan provides a policy basis for ecotourism, accessibility, community involvement, local enterprises, and mitigation, but implementation needs to be phased according to local readiness rather than policy ambition alone [21].

Contribution to Coastal Regional Development

Three contributions emerge from the findings. First, destination readiness and growth opportunity should be treated as different analytical constructs. Wondiboy lies in Quadrant I because external opportunities are strong, yet the relatively narrow internal coordinate indicates that expansion should pass through a readiness threshold. A growth-oriented strategy therefore does not mean immediate promotion. Growth can initially mean increasing internal capability so that future investment and visitor flows do not exceed service and environmental capacity.

Second, the study treats a functional coastal area as the planning unit. Ramiki remains administratively part of Wasior District, but ecological continuity and service relationships make it relevant to the Wondiboy corridor. This reduces fragmentation when attractions, access, facilities, and communities are distributed across administrative boundaries. For regional and urban management, the implication is that coastal destinations operate through networks rather than through isolated villages or single attractions.

Third, the study connects tourism strategy with infrastructure and resilience. Weak ancillary services, amenities, safety, and mitigation demonstrate that ecotourism development is simultaneously a regional-service and governance problem. Conservation is not an obstacle to development but a condition for keeping tourism assets productive. Community empowerment is likewise not an additional social program; it is a mechanism for retaining economic value, local knowledge, and adaptive capacity. These findings reinforce current research linking resilience, collaborative governance, and community welfare in tourism development [10-13].

CONCLUSION

The Wondiboy coastal area has a strong basis for development as a community-based ecotourism corridor, but destination readiness remains uneven. The first research objective is answered by the 6A assessment: Attraction is the principal strength with a visitor score of 4.17, while the visitor 6A mean of 2.93 indicates only moderate overall readiness. Mangroves, sago forests, bay landscapes, marine activities, cultural practices, and religious assets can be assembled into cross-village products linked to the Wasior-Rasiei service center.

The second objective shows that the most important constraints are not insufficient attractions but weak ancillary services, institutions, basic amenities, safety, activity organization, environmental management, and human-resource capacity. The very low visitor score for Ancillary Services (1.51) is the clearest evidence of the gap between resource potential and actual destination services. Strong community support is valuable, but it should not be interpreted as operational readiness until it is converted into organizations, trained guides, products, standards, and accountable benefit-sharing mechanisms.

The third objective results in a SWOT position of (+0.55; +1.03) in Quadrant I. Nevertheless, WO measures should precede broad SO expansion because the internal advantage is still narrow. The recommended sequence is institutional and human-resource strengthening; basic sanitation, facilities, and safety; controlled ecotourism products, zoning, and carrying-capacity management; followed by gradual market connectivity, digital promotion, and green investment. The scientific contribution lies in separating internal and external evidence sources, screening SWOT through ICZM, CBT, carrying capacity, and resilience, and using a functional area across administrative boundaries as the planning basis.

The study has limitations. The visitor 6A reliability coefficient of 0.559 restricts the use of visitor scores as stand-alone evidence; all surveyed visitors came from Teluk Wondama and therefore do not represent external markets; the number of regional



expert assessors was limited; and the carrying-capacity calculation used indicative usable-area values rather than a final ecological quota. Future research should measure ecological and social carrying capacity directly, include regional and national visitor segments, test willingness to pay and market segmentation, evaluate household-income distribution, and undertake longitudinal monitoring of ecosystem and service changes after interventions. Such evidence would allow the current planning strategy to evolve into a measurable adaptive-management model.

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