

Community-Associated Ecotourism and Mangrove Conservation Planning in a Protected Coastal Landscape: Guang-Guang Mangrove Park, Pujada Bay, Philippines

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Research Article

Keywords: benefit-sharing, community participation, mangrove conservation, protected-area governance, sustainable tourism, visitor management

Posted Date: October 13th, 2026

DOI: <https://doi.org/10.21203/rs.3.rs-11051778/v2>

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Additional Declarations: The authors declare no competing interests.

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Landscape: Guang-Guang Mangrove Park, Pujada Bay, Philippines

Abstract

Mangrove ecotourism occurs in coastal ecosystems that support shoreline protection, fisheries and livelihoods; visitor use therefore requires governance that safeguards ecological integrity. This mixed-methods case study examined community-associated ecotourism at Guang-Guang Mangrove Park and Nursery, within the Pujada Bay Protected Landscape and Seascape, Mati City, Philippines. Data comprised a participatory transect walk with six participants, semi-structured interviews with 12 stakeholders, and an availability survey of 54 adult visitors collected from April to June 2023. Qualitative records were analyzed thematically and survey data descriptively. Visitors expressed favorable views of conservation and community involvement (mean profile score 4.65/5). Of 53 respondents who answered the entrance-fee item, 49 answered yes, one gave a qualified response and three answered no. These are stated attitudes, not payment behavior or realized benefits. Transect observations and stakeholder accounts identified litter, vandalism, limited interpretation, service constraints, revenue restrictions, limited community influence over strategic decisions and coordination gaps. The findings characterize the site as multi-stakeholder and community-associated, with stewardship and operational participation but no evidence of fully institutionalized community authority or benefit-sharing. Protected-area planning should make visitor use conditional on mangrove safeguards, transparent authorized revenue, representative participation, monitoring and interpretation. Ecological impacts, carrying capacity and household benefits require assessment before claims of sustainability or expansion.

Keywords: *benefit-sharing; community participation; mangrove conservation; protected-area governance; sustainable tourism; visitor management*

1. Introduction

Mangrove ecosystems provide provisioning, regulating, cultural and supporting services to coastal communities, including shoreline protection, fisheries support, carbon storage, habitat and opportunities for recreation (Barbier et al., 2011; Lee et al., 2014; Nyangoko et al., 2022). Their ecological condition is therefore linked to both coastal risk reduction and livelihood security. Yet mangroves remain exposed to land conversion, aquaculture expansion, infrastructure, pollution and unsustainable extraction. Global assessments document continuing changes in mangrove extent, with Southeast Asia an important region of concern (Bunting et al., 2022). In the Philippines, aquaculture conversion, settlement and weak enforcement have historically contributed to mangrove loss (Garcia et al., 2014; Primavera, 2000). These pressures make mangrove conservation a coastal-planning and governance issue as well as an ecological one.

In the Philippines, mangrove protection also has distributional consequences. Mangroves can reduce coastal flooding risks, including for vulnerable and low-income residents (World Bank Group, 2016), while restrictions on cutting, fishing access or aquaculture may affect resource users. Research has linked mangrove decline to overlapping institutional mandates, weak enforcement and incentives that favored aquaculture conversion, indicating that planting alone cannot address the drivers of loss (Primavera, 2000). Restoration and protection are more likely to endure when they account for local institutions, social conditions and livelihood dependence (Rönnbäck et al., 2007; Song et al., 2021; Valenzuela et al., 2020; Walters et al., 2008).

Ecotourism is one possible management and financing mechanism within this wider coastal context, but it does not automatically reconcile conservation and development. In principle, it can provide interpretation and generate resources for conservation, while also creating visitor

pressures and distributional questions (Fennell, 2020; Friess, 2017; Stronza et al., 2019). Recent Southeast Asian work describes mangrove ecotourism as a possible educational and financial mechanism, with outcomes contingent on governance, visitor management and benefit arrangements (Blanton et al., 2024). In the Philippines, ecotourism value chains also depend on visitor experience and community participation (Rivera & Gutierrez, 2019). Community-based ecotourism (CBET) places particular emphasis on local roles in planning, operations, management and benefit-sharing (Mohd Noh et al., 2020; Scheyvens, 1999). Because participation ranges from attendance or implementation to influence over rules, revenue and enterprise decisions, the label should be applied with care (Arnstein, 1969; Pretty, 1995; Tosun, 2000).

A central governance concern is that communities may contribute labor or receive limited benefits without holding meaningful authority over decisions. Philippine community-based tourism research has described participation gaps and dependence on government or external actors (Gutierrez, 2022). Broader studies likewise caution that ecotourism is not a guaranteed response to conservation or poverty challenges when visitor growth, weak governance and unequal benefit distribution remain unresolved (Das & Chatterjee, 2015; Ghosh & Ghosh, 2019; Stronza & Gordillo, 2008). Effective environmental participation requires more than stakeholder presence: representation, transparency, deliberation and influence over outcomes matter (Reed, 2008).

These questions are consequential in protected areas, where tourism has to remain consistent with conservation objectives, management plans and authorized resource-use rules. The Expanded National Integrated Protected Areas System Act of 2018 provides for Protected Area Management Boards (PAMBs), protected-area planning and financial mechanisms, including

retained income accounts (Republic Act No. 11038, 2018). Visitor-management guidance for protected areas emphasizes safeguards, local participation, interpretation and management capacity (Leung et al., 2018). These frameworks make institutional clarity and accountability central to deciding whether visitor use supports or undermines protected-area objectives.

Guang-Guang Mangrove Park and Nursery in Mati City, Davao Oriental, is a useful case for examining these interactions. The site is situated within the Pujada Bay Protected Landscape and Seascape and has conservation, nursery and visitor-use functions; it is also referred to as the City of Mati Environmental & Eco-Tourism Center (CMEEC) (Inoco & Villegas, 2024; Jimenez et al., 2015). A boardwalk, registration area, nursery and related facilities support visitor access and restoration activities involving government offices, academic institutions, a non-government organization and community groups. Previous local studies describe mangrove growth, restoration and species composition in Guang-Guang and nearby Dahican (Bersaldo et al., 2023; Uyanguren, 2017; Yap et al., 2023). Perception research in Guang-Guang has also reported visitor recognition of mangroves' coastal and livelihood functions alongside concerns about shrimp-pond expansion, plastic pollution, land reclamation and illegal cutting (Inoco & Villegas, 2024). Less attention has been given to how ecotourism governance, protected-area institutions, revenue arrangements, community influence and visitor management interact with conservation objectives at this site. This case addresses that planning and management gap by examining whether current arrangements support community participation and conservation, while distinguishing operational involvement from decision-making authority.

This study assessed the challenges and opportunities for community-associated mangrove ecotourism at Guang-Guang Mangrove Park and Nursery. It aimed to: (1) characterize ecotourism activities, facilities, visitor profile and stakeholder involvement; (2) examine

stakeholder and visitor perceptions across environmental, social, economic and governance dimensions; (3) identify constraints related to infrastructure, revenue governance, benefit-sharing, visitor management and participation; (4) assess how far current arrangements reflect community involvement, local benefit, shared decision-making and conservation-oriented management; and (5) derive case-based management implications for mangrove conservation and visitor use within the protected-area context.

2. Materials and Methods

2.1 Study site

The study was conducted at Guang-Guang Mangrove Park and Nursery, southeast of Mati City, Davao Oriental, southeastern Mindanao, Philippines (Figure 1). The site is associated with the Pujada Bay Protected Landscape and Seascape and the city's mangrove conservation and ecotourism activities. Mati City had a population of 148,672 based on the 2024 census (Philippine Statistics Authority, 2026). Coastal livelihoods in the city are linked to fisheries, agriculture, tourism and ecosystem services (Macusi et al., 2019).

Conservation activities at the site involve local community members, a regional university coastal-resource center, Mama Earth Foundation, the Department of Environment and Natural Resources (DENR), local government offices and other civil-society partners. A prior study described approximately 850 ha of generally planted mangroves along the shoreline; this extent was not remeasured in the present study (Bersaldo et al., 2023). A plot-based assessment of Guang-Guang reported 19 mangrove species (Yap et al., 2023). Plot-based assessments in Guang-Guang documented species including *Ceriops tagal*, *Rhizophora stylosa*, *R. apiculata*, *Bruguiera gymnorhiza*, *Sonneratia alba*, *Avicennia officinalis*, *Pemphis acidula*, *Aegiceras corniculatum* and *A. alba* (Yap et al., 2023); nearby Dahican assessments described *Rhizophora*-dominated stands with settlement, cutting and other disturbances (Uyanguren, 2017).

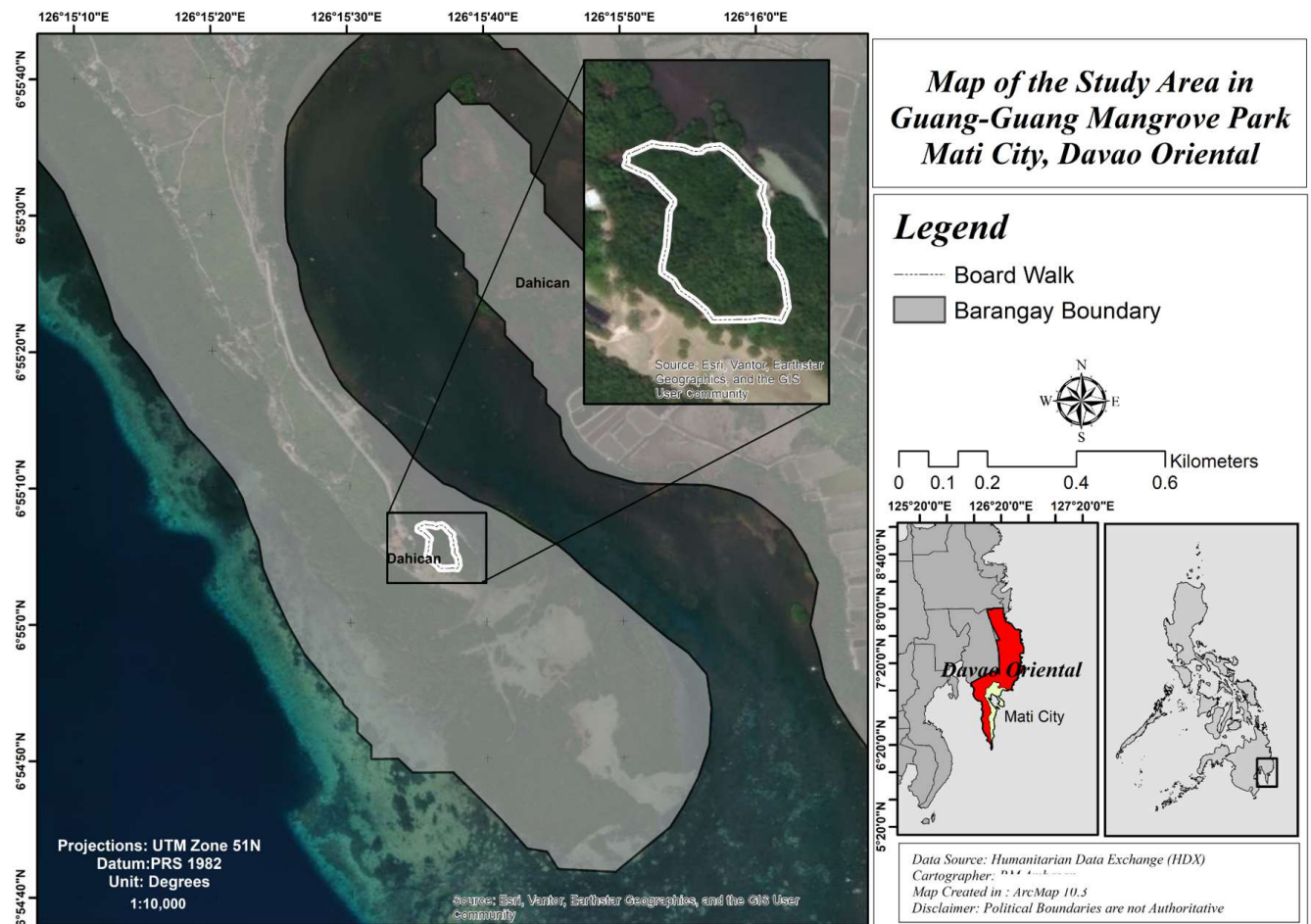


Figure 1. Location of Guang-Guang Mangrove Park and Nursery in Mati City, within the Pujada Bay coastal landscape.

Visitor facilities include an entrance and registration area, comfort rooms, a mangrove nursery and a concrete boardwalk approximately 333 m long, completed in 2021. The site layout and facilities are shown in Figure 2; the transect route and selected observation points are shown in Figure 3. These published ecological descriptions provide context; the present study did not independently measure mangrove extent, composition or condition.



Figure 2. Site layout and major visitor facilities of Guang-Guang Mangrove Park and Nursery, Mati City, Davao Oriental, Philippines.



Figure 3. Transect-walk route and selected observation points within Guang-Guang Mangrove Park and Nursery.

2.2 Research design and analytical framework

The analysis used a modified Quadruple Bottom Line framework comprising environmental, economic, social and organizational or governance dimensions (Table 1; Figure 4). Adapted from Rivera and Gutierrez (2019), it organized evidence on ecological safeguards, livelihood conditions, community participation and institutional arrangements. The framework structured interpretation; it was not used to calculate a composite sustainability score.

A deductive codebook defined each dimension and its indicative evidence. The unit of analysis was a meaning unit representing an experience, practice, perceived benefit, constraint or governance issue. Passages could be coded under more than one dimension. Environmental codes covered mangrove protection, visitor impacts, resource use, monitoring and education; economic codes covered livelihoods, employment, revenue, benefit allocation, infrastructure and financial constraints; social codes covered participation, stewardship, ownership, capacity and perceived benefits; and governance codes covered stakeholder roles, coordination, revenue rules, accountability, decision authority and protected-area links. Participation was interpreted by its depth: involvement in implementation was distinguished from influence over planning, rules, finances, monitoring and benefit allocation (Scheyvens, 1999; Tosun, 2000). The framework served as an organizing heuristic for comparing evidence sources and perspectives, not as a validated measure of empowerment or sustainability (Wondirad et al., 2020).

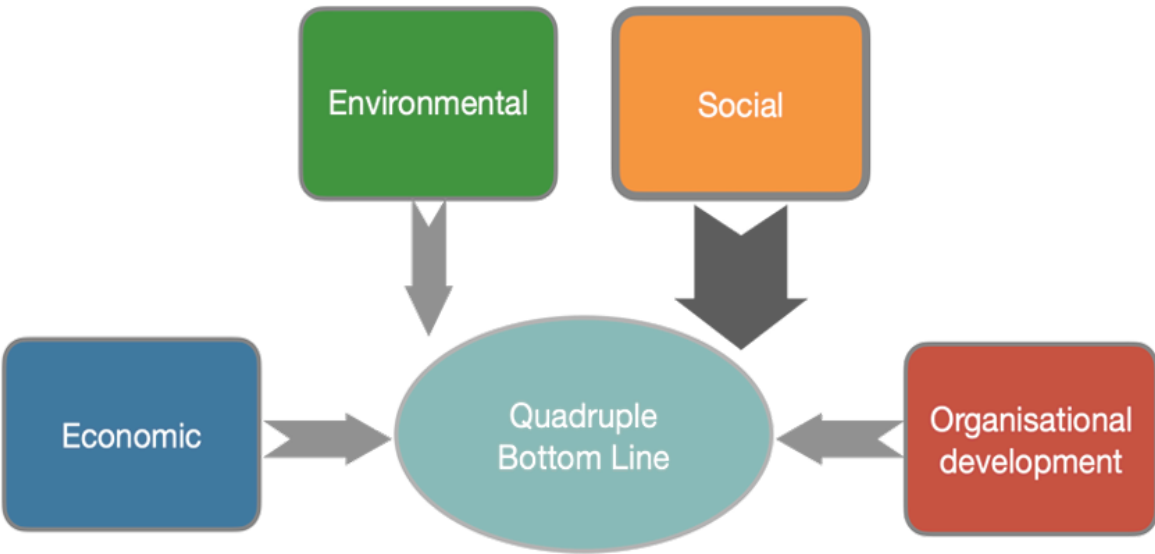
Table 1. Data sources and analytical linkage to the modified Quadruple Bottom Line framework.

Dimension	Main questions examined	Primary data sources	Examples of indicators or themes
Environmental	How does tourism relate to mangrove protection and visitor impacts?	Transect walk, interviews, tourist survey	Litter, vandalism, environmental awareness, interpretation and carrying-capacity concerns

Dimension	Main questions examined	Primary data sources	Examples of indicators or themes
Economic	What livelihood and revenue opportunities or constraints are present?	Interviews, tourist survey, field observations	Employment, entrance-fee support, infrastructure limits, enterprise potential and visitor spending
Social	How are community participation, ownership and local benefits perceived?	Interviews, transect walk, tourist survey	Stewardship, community pride, participation in conservation, women and fisherfolk involvement
Organizational	How do governance, coordination and institutional arrangements shape CBET?	Stakeholder analysis, interviews, document-informed review	Decision-making power, PAMB/LGU/DENR roles, NGO intermediation and political continuity

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Figure 4. Quadruple Bottom Line framework modified from Rivera and Gutierrez (2019).

2.3 Participatory transect walk

A participatory transect walk was conducted on 27 April 2023 with six participants, including the external supervisor and officers from the City Civil Security Unit and DENR. Transect walks can document site conditions and prompt place-based discussion (Kanstrup et al., 2014; Okoko et al., 2023). Participants followed an anticlockwise route along the boardwalk for approximately 50 minutes. GPS points, field notes and photographs documented facilities, observed environmental conditions, visitor-management concerns and participant observations. No audio recording was made; the walk therefore contributes field observations and recorded notes, not a verbatim interview dataset.

2.4 Semi-structured stakeholder interviews

Twelve key informants were selected purposively because of their involvement in park management, conservation, tourism, enforcement, community organization or protected-area governance (Palinkas et al., 2015). They represented local government, the City Tourism Office, the City Environment and Natural Resource Office, City Civil Security Unit, PENRO- and CENRO-linked offices, Mama Earth Foundation and the Women's City Federation (Table 2). This information-rich sample reflects selected institutional and organizational perspectives; it was not designed to represent all residents or stakeholder groups.

The interview guide contained 27 questions about economic, environmental, social and governance aspects of mangrove ecotourism. Seven interviews were audio-recorded and transcribed; five were documented through detailed field notes because of respondent preference or field conditions. Five interviews were conducted in Cebuano with assistance from locally based research assistants. Participants were classified as ground-level staff or management-level

stakeholders to compare the accounts available from operational and decision-making roles; this classification does not imply that all levels or offices were equally represented. Transcripts and detailed field notes were treated as qualitative records for thematic analysis. For interviews without recordings, only clearly captured themes were included. Interview findings are reported as accounts or perceptions of these informants and are not estimates of the prevalence of an experience across the wider community.

Table 2. Stakeholder interview participants and their roles (n = 12).

No.	Date	Agency / Organization	Code Name	Management Level
1	01/05/2023	City Civil Security Unit (CCSU)	JO 1	No
2	01/05/2023	City Tourism Office	JO 2	No
3	01/05/2023	City Environment and Natural Resource Office (CENRO)	JO 3	No
4	01/05/2023	City LGU	JO 4	No
5	16/05/2023	City LGU	JO 5	No
6	17/05/2023	Mama Earth Foundation (NGO)	NGO 1	Yes
7	26/05/2023	City Tourism Office	Tourism 1	Yes
8	26/05/2023	Women's City Federation (WCF)	WCF 1	Yes
9	01/05/2023	City Tourism Office	JO 6	No
10	29/05/2023	City Environment and Natural Resource Office	Environment 1	Yes
11	29/05/2023	CENRO Environmental Specialist	Environment 2	Yes
12	08/06/2023	PENRO with CENRO official present	Environment 3	Yes

Note: JO = job order; LGU = local government unit; NGO = non-government organization; PENRO = Provincial Environment and Natural Resources Office; CENRO = Community Environment and Natural Resources Office.

2.5 Tourist survey

A structured visitor survey was administered after visitors completed the boardwalk loop. It asked about visitor characteristics and motivations, environmental attitudes, ecotourism perceptions, support for entrance fees and facility ratings. Items were informed by ecotourism principles and pilot-tested on 30 April 2023. Final forms were available in English and Cebuano. Surveys were administered on five field days between April and June 2023. Adults aged 18 years or older were invited to participate when researchers were present; this was an availability sample, not a probability sample of park visitors. Fifty-four valid responses were obtained. Likert items used a five-point scale (1 = strongly disagree to 5 = strongly agree). The ecotourist-profile score was the mean of seven items concerning community value and involvement, environmental protection and education, and site attractiveness. Because survey days and visitor availability constrained recruitment, findings describe these respondents only and cannot be generalized to all visitors.

2.6 Data analysis

Interview transcripts, interview notes and transect-walk notes were analyzed thematically using deductive codes from the study objectives and framework, with inductive codes added for recurrent topics such as education, collaboration, economic management, political continuity, litter and vandalism (Braun & Clarke, 2006). Survey data were entered in Microsoft Excel and summarized with frequencies, percentages, means and standard deviations. The stakeholder interest-influence matrix drew on interview accounts, observed roles and document-informed understanding of formal responsibilities. It is an analytical heuristic for organizing relative interest and influence, not a measured or statistically validated power score.

2.7 Limitations of this study

Several limitations qualify the findings. The visitor survey included only 54 respondents recruited on five field days through availability sampling. Respondents were predominantly young, local, postsecondary-educated and environmentally active, so their favorable attitudes may not reflect the wider visitor population. Fisherfolk, informal workers, vendors, households and unaffiliated residents were underrepresented, while the 12 purposively selected stakeholder interviews provide a relatively small and institutionally weighted set of accounts. Some interviews were documented only in notes; interpretations therefore rely partly on participant perceptions and the clarity of field records. The study did not measure mangrove condition or visitor-related ecological change, establish ecological or social carrying capacity, assess household incomes or livelihood dependence, observe actual benefit distribution, or conduct a formal willingness-to-pay study. Stated support for an entrance fee is not payment behavior, and perceived livelihood opportunity is not measured income or empowerment. The cross-sectional data were collected from April to June 2023, during a particular reopening and management period, and cannot establish causal relationships or current conditions. Finally, this single-site case is context-specific; transfer to other Philippine coasts requires attention to differences in protected-area rules, ecosystems, tenure, visitor demand and local institutions. These limits mean the results identify governance questions and management priorities for this case, not demonstrated long-term sustainability or community-wide outcomes.

3. Results and Discussion

3.1 Stakeholder landscape and governance implications

The stakeholder analysis placed Guang-Guang within a network of national agencies, local government offices, community organizations, academic institutions, non-government

organizations and site personnel (Figure 5). Based on the study's document-informed matrix, DENR-related offices, the City Tourism Office and Mama Earth Foundation were classified as key players because they combined relatively high influence with engagement in conservation or visitor activities. The City Environment and Natural Resource Office, city leadership and national government actors were classified as context setters because of their policy or resource influence, although their operational roles differed. These are analytical classifications based on the sources described in Methods, not independently measured rankings of institutional power. The matrix classified local fisherfolk, researchers, a regional university coastal-resource center, the Women's City Federation and some local government units as having high interest but comparatively lower direct influence. This pattern raises a planning question: whether actors with a direct stake in mangrove conservation and tourism can shape rules, investment priorities and benefit-sharing. On the evidence available, Guang-Guang is more accurately described as a multi-stakeholder, community-associated site than as a fully community-controlled CBET initiative. This interpretation is consistent with literature describing gaps between community implementation roles and strategic decision authority (Kunjuraman et al., 2022; Tosun, 2000). The matrix identifies a potential participation issue; it does not quantify power or prove that every listed actor lacks influence. Legitimacy and local support are likely to depend on responsive processes and how conservation rules interact with livelihoods (Bennett & Dearden, 2014).

The site has community associations through restoration, stewardship, employment and organizational participation, as described by informants and previous local work (Inoco & Villegas, 2024). The present evidence does not establish that community members control strategic decisions or receive an equitable share of tourism revenue. CBET assessment should

therefore examine who can influence fees, enterprise access, visitor rules and conservation priorities, in addition to recording attendance at meetings or participation in planting (Scheyvens, 1999).

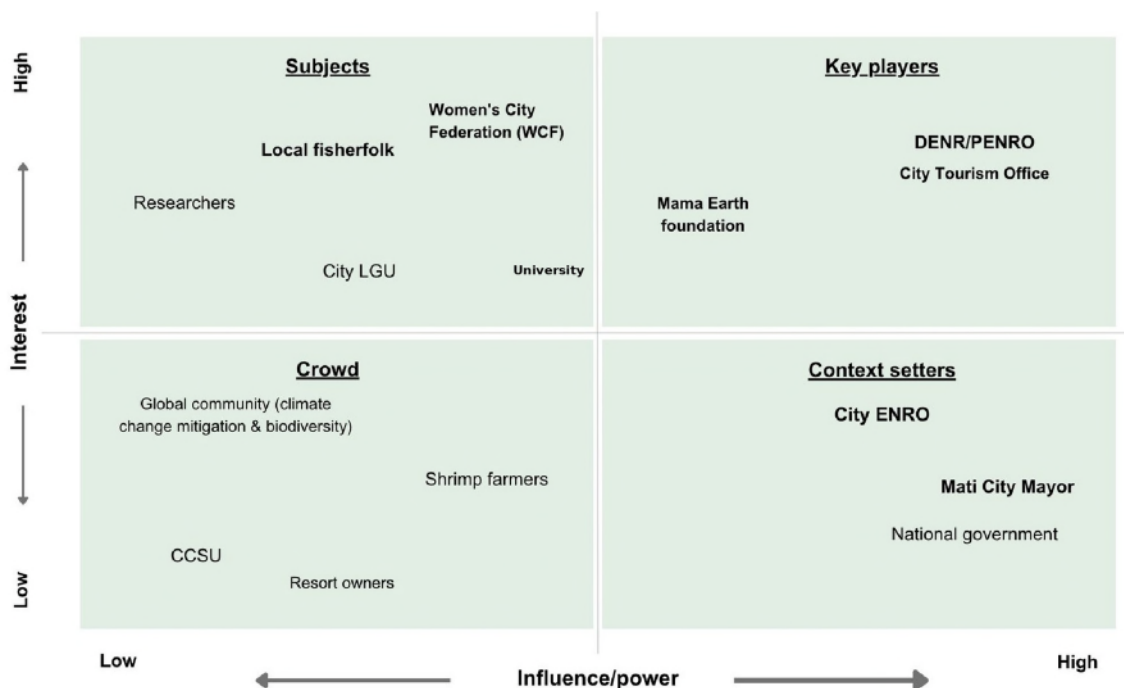


Figure 5. Stakeholder interest-influence matrix based on the study's qualitative and document-informed analysis. Quadrants are heuristic classifications, not measured power scores.

3.2 Visitor profile and current tourism status

Visitor records for January to April 2023 indicated that recorded visitors were predominantly domestic, with local visitors comprising 99.68% of recorded tourist entries. Among survey respondents, 36 of 47 who reported origin (77%) were local; 61% were aged 18–25 years and 41% were enrolled in college or university. Private transport was reported by 91% of respondents. The demographic percentages use the available responses for each item. These administrative records and survey responses describe different sources and periods and should not be treated as interchangeable estimates.

The observed visitor profile indicates local and domestic use during the periods represented in the available records and sample. The site may provide a setting for local recreation and environmental learning, but the sample's educational and university-affiliated composition could elevate measured conservation awareness. Nearly half of respondents reported stays of less than one hour; stakeholders associated short visits with limited amenities, lack of electricity and water, and few activities beyond walking and photography. These are stakeholder explanations, not tested causal effects. The results describe a local visitor setting and do not establish demand from international markets or justify increased promotion. Table 3 summarizes the survey respondents.

Table 3. Summary of visitor sample characteristics based on survey responses (n = 54).

Variable	Main result	Interpretive note
Gender	53% female; 47% male (n = 53)	Approximately balanced gender distribution
Age	61% aged 18-25 years	Young visitors dominated the sample
Education	77% with undergraduate, graduate or vocational postsecondary education (40/52); 41% enrolled in college/university (22/54)	The sample profile may partly shape the reported environmental-awareness scores.
Origin	77% local among respondents reporting origin (36/47)	The site functions mainly as a local/domestic destination
Transport	91% used private transport	Access is easier for visitors with private vehicles
First-time visitors	17% first-time visitors	Most respondents had visited previously
Visit duration	49% stayed less than 1 h	Amenities and activities may limit length of stay
Main motivations	Relaxation, photography/social media and nature enjoyment	The site has recreational and educational potential

3.3 Environmental awareness and ecotourism values

Survey respondents expressed favorable views on the seven ecotourist-profile items, producing an overall mean score of 4.65 out of 5.00. Community involvement in mangrove restoration and conservation and the attractiveness of mangrove forests as destinations received the highest item

means (4.75 each); environmental protection as an ecotourism attribute had a mean of 4.66 (Table 4). These scores describe attitudes among the surveyed visitors, not behavior or conservation outcomes. Sixty-seven percent reported previous participation in environmental activities such as conservation meetings or cleanups, and many respondents were young or university-affiliated. The sample therefore likely overrepresents environmentally oriented visitors relative to the full visitor population. Local perception research has also reported recognition of mangroves' shoreline, habitat and livelihood functions (Inoco & Villegas, 2024), but this convergence does not establish that awareness changes behavior. Interpretation and monitoring remain management options for linking stated values to visitor conduct; their effectiveness at Guang-Guang was not evaluated in this study (Fennell, 2020; Thompson, 2022).

Table 4. Visitor responses to ecotourism profile items (n = 54).

#	Theme	Statement	Mean	SD
1	Community value	Community-managed project is important.	4.62	0.53
2	Community value	Ecotourism can provide additional income.	4.58	0.53
3	Community involvement	Community involvement is important for mangrove restoration and conservation.	4.75	0.48
4	Environmental protection	Environmental protection is important in ecotourism.	4.66	0.52
5	Environmental protection	Ecotourism can support mangrove conservation.	4.64	0.60
6	Environmental education	Environmental education is important in ecotourism.	4.55	0.54
7	Site attraction	Mangrove forests are attractive tourist destinations.	4.75	0.43
Average ecotourist-profile score			4.65	

Note: Likert scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree. SD = standard deviation.

3.4 Facility assessment, visitor management and environmental education

Facility ratings were generally positive: the boardwalk had the highest mean rating (4.69/5.00), followed by cleanliness (4.59). Information and education facilities had a lower mean rating (4.26), while maintenance concerns, including vandalism, received a mean of 4.22 (Figure 6). In open comments and during the transect walk, respondents and observers raised litter, vandalism, limited interpretation and signage as concerns. Ratings, comments and observations are distinct forms of evidence and are presented as such.

Transect observations documented plastic waste among roots, on branches and in open areas; this was despite restrictions on food and drink along the boardwalk. Stakeholders also reported vandalism and difficulty controlling visitor behavior. These observations and accounts point to visitor-management needs but do not measure the frequency, ecological effect or trend of impacts. Protected-area visitor guidance recommends linking use to monitoring, interpretation and management capacity (Leung et al., 2018). Accordingly, carrying capacity should not be reduced to a single visitor ceiling; practical planning would also define resource-condition indicators, acceptable changes and responses to observed impacts (McCool & Lime, 2001).

At the time of data collection, educational materials were limited and guides were not consistently available to all visitors. The existing nursery and boardwalk could provide settings for guided walks, school activities and interpretation of mangrove diversity, fisheries connections, coastal protection and waste impacts. These are management opportunities inferred from site features and the observed information gap; the study did not test their effects on visitor behavior, learning or livelihoods. Locally grounded content could draw on published Guang-Guang and Dahican assessments (Inoco & Villegas, 2024; Uyanguren, 2017; Yap et al., 2023). Any guide or education program would require training, staff time, community participation and

monitoring to determine whether it contributes to conservation objectives (Buckley, 2012; Fennell, 2020).

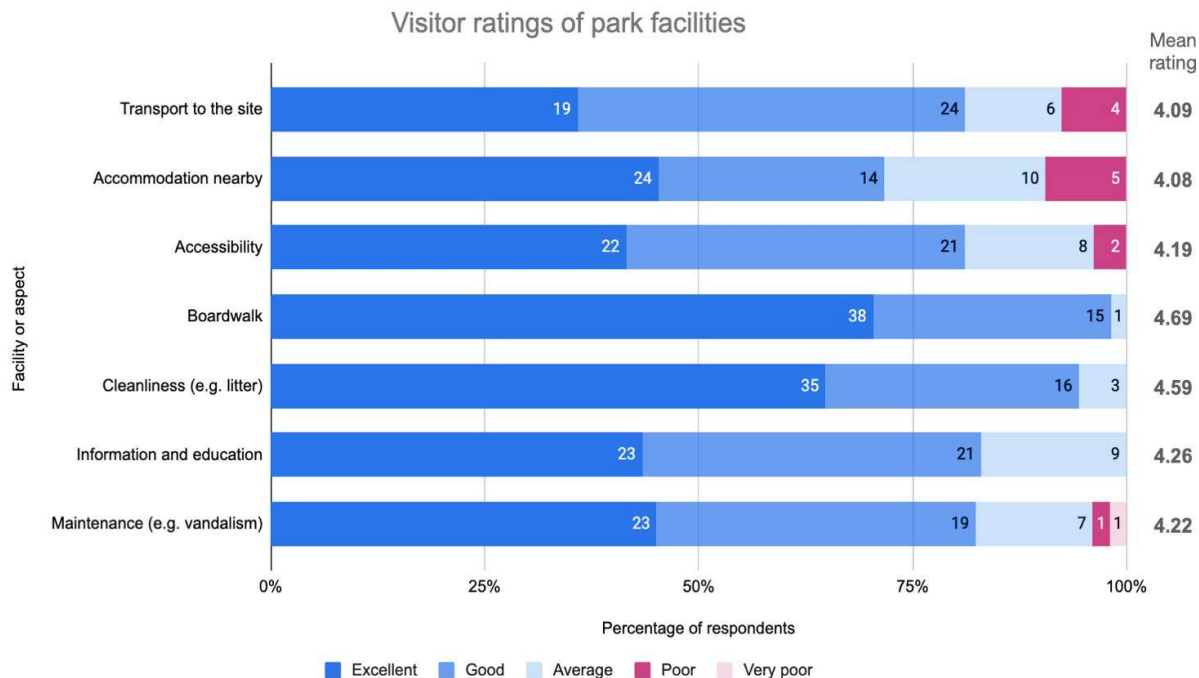


Figure 6. Visitor ratings of selected park facilities at Guang-Guang Mangrove Park. Values inside bars indicate respondent counts per rating category; mean ratings are shown at right.

3.5 Economic constraints, revenue governance and benefit-sharing

Stakeholders identified planting, nursery work, guiding, security, cleaning, food selling, souvenir production and interpretation as existing or potential livelihood roles. Interview accounts indicated that direct opportunities were limited and some were informal or irregular. The study did not count jobs, estimate income or compare benefits among households; these roles should therefore be treated as reported opportunities and constraints rather than measured livelihood outcomes.

Informants identified uncertainty or restrictions around the use of standard entrance-fee collection as a major economic and management constraint. The study did not audit the

333 applicable fee arrangements or determine legal authority for a new charge. Of 53 responses to the
334 entrance-fee item, 49 were “yes,” one was qualified and three were “no” (one of the 54 survey
335 records did not provide a classifiable response). The responses indicate stated interest, not a
336 formal willingness-to-pay estimate, actual payment behavior or proof that a fee would generate
337 equitable benefits. Any environmental fee, donation or guided-tour charge would first require
338 confirmation of legal authority and consistency with protected-area and local government rules.
339 If authorized, it would need transparent collection, public reporting, clear allocation rules and
340 community participation in budget decisions, with a documented link to conservation,
341 maintenance, education and local roles.

342 Support for a fee does not establish that a fee system would distribute benefits fairly. Such a
343 mechanism would require authorized collection procedures, public reporting, agreed allocation
344 rules and community influence over spending. Without those arrangements, revenue could
345 support site or institutional costs without reaching households, guides, nursery workers or
346 community organizations in a visible and agreed manner. Benefit-sharing is therefore a
347 governance question to resolve and monitor, not an automatic effect of increased visitation.

348 Stakeholders also described limited electricity, water and access infrastructure as constraints on
349 services and local enterprise. The survey found that 91% of respondents used private transport,
350 which suggests that access options in the sample were dominated by private vehicles; the study
351 did not assess travel costs or access barriers directly. Infrastructure proposals should be evaluated
352 first for compatibility with mangrove protection, sanitation, waste control and local livelihood
353 needs. Investments should not be justified solely by their potential to extend stays or attract more
354 visitors; increased access or facilities could also raise environmental pressure if safeguards and
355 operating capacity are insufficient (Ross & Wall, 1999; Thompson, 2022).

3.6 Community participation, stewardship and empowerment

Stakeholders described local pride, stewardship and awareness of links between mangrove condition and fisheries resources. Participants involved in planting, guarding, cleaning and restoration were perceived by informants as developing a stronger sense of ownership. These are reported perceptions; the study did not measure changes in conservation behavior or ecological outcomes. The accounts are compatible with community-based conservation literature emphasizing the potential roles of local knowledge, trust, rules, monitoring and social capital (Berkes, 2004; Ostrom, 1990; Pulhin et al., 2017; Pretty & Smith, 2004).

Interview accounts and the stakeholder matrix indicate that participation was more evident in implementation and consultation than in strategic decision-making. Informants described community participation in meetings, conservation activities and site operations, while decisions concerning infrastructure, fees, promotion and management appeared to remain concentrated among institutional actors. The small purposive sample cannot establish how all residents experience these processes. Still, the evidence supports examining whether community representatives can influence planning, rule-making, revenue allocation and monitoring. Under empowerment criteria, the accounts suggest stronger perceived social and psychological dimensions than economic or political control; these dimensions were not measured with a validated scale (Scheyvens, 1999).

Taken together, the case evidence is consistent with partial rather than fully institutionalized CBET: community involvement is reported in restoration, operations and stewardship, while community control over strategic decisions, revenue allocation, enterprise access and visitor management is not demonstrated. This distinction should guide planning and evaluation. Before

describing the site as community-managed, future assessment would need to document formal authority, representation, actual benefit flows and community influence over decisions.

3.7 Environmental conservation and organizational capacity

Stakeholders expressed the view that tourism should remain subordinate to environmental protection. One environmental informant summarized this position by stating that tourism depends on the environment. This is a stakeholder perspective rather than a measured ecological threshold, but it is consistent with a conservation-first approach in which visitor use is conditional on mangrove protection.

Litter and vandalism were observed or reported as current concerns; informants also raised possible visitor-growth effects and external pressures such as aquaculture encroachment. Some described recurring mangrove cutting and reoccupation in areas where mangroves regenerate. The study did not independently map or verify the extent of these external pressures. Local studies have also discussed shrimp-pond conversion, plastic pollution, land-use change, illegal cutting, settlement and policy implementation concerns (Inoco & Villegas, 2024; Uyanguren, 2017; Yap et al., 2023). Together, these sources indicate that tourism management cannot substitute for broader coastal land-use governance and enforcement. A conservation-first plan would make promotion conditional on waste control, compliance monitoring, habitat protection and agreed visitor-use standards; the present study did not evaluate the effectiveness of such measures.

Coordination was viewed positively by several informants, but interview accounts also pointed to differences in how management-level and ground-level personnel understood formal processes. This reported information gap matters for the consistency of visitor guidance, enforcement and feedback. Operational clarity requires agreement on who sets and

communicates visitor rules, monitors compliance, receives and reports revenue, decides expenditures, and brings community concerns into management decisions. The study identifies these as coordination needs; it did not audit institutional performance.

The protected-area context can provide safeguards through PAMB and DENR oversight, management planning and rules for resource use and revenue. It can also create constraints if authority over fees, maintenance budgets, enterprise approvals and visitor rules is unclear to site personnel and community participants. The management task is to make roles and procedures understandable, lawful and participatory within the protected-area structure, rather than treating tourism as outside that structure. The precise local allocation of authority and any fee permissions should be confirmed with the relevant PAMB, DENR and LGU records.

3.8 Coastal conservation and protected-area management implications

The case evidence supports a staged coastal-management agenda. First, define ecological safeguards and monitoring priorities for mangrove condition, waste, visitor conduct and external land-use pressures; tourism use should remain subordinate to those safeguards. Second, clarify the respective roles of the PAMB, DENR, LGU offices, community organizations and site personnel, including who sets rules, approves facilities and reviews impacts. Third, establish representative and continuing community participation that includes groups underrepresented in this study, especially fisherfolk, women, workers and unaffiliated residents. Fourth, confirm the legal basis for any fee and develop transparent collection, reporting and allocation arrangements with community input before treating visitor revenue as conservation finance. Fifth, set visitor-management procedures, including routine counts, waste controls, clear behavior rules, incident recording and a process for adjusting use when monitoring identifies problems. Sixth, consider only infrastructure that meets conservation, sanitation and access needs and can be operated and

maintained. Seventh, develop interpretation with local guides, schools, a regional university coastal-resource center, DENR and community partners, then evaluate whether it improves knowledge or conduct. These are management implications derived from the case, not outcomes tested by this study.

Livelihood options could include trained local guiding, nursery interpretation, school activities, locally managed refreshments outside sensitive areas, educational products and paid maintenance or waste-monitoring roles, subject to community agreement and protected-area rules. These possibilities require household-level assessment and transparent access criteria before they can be described as benefits. Linking Guang-Guang to Dahican or wider Pujada Bay tourism circuits should be considered only after safeguards, institutional responsibilities, monitoring and benefit-sharing are functioning. Tourism growth should proceed cautiously because management demand may rise faster than the capacity to protect habitats, control waste and distribute benefits. The recommendations are summarized in Table 5.

Table 5. Case-derived management priorities for mangrove conservation and community-associated ecotourism at Guang-Guang.

Priority area	Recommended action	Responsible actors	Potential management value
Safeguards	Set mangrove, waste and visitor rules; monitor habitat and external pressures before promotion.	PAMB, DENR, LGU, site and community monitors	Helps assess whether visitor use is compatible with conservation.
Institutional roles	Clarify who sets rules, approves facilities, monitors use and reports revenue.	PAMB, DENR, Mati City LGU	May improve accountability across agencies.
Community voice	Establish ongoing representation for fisherfolk, women, youth, workers and residents.	PAMB/LGU, community groups, site staff	Could strengthen influence on planning and management.
Revenue rules	Confirm fee authority; publish collection, allocation and reporting procedures with community input.	PAMB, DENR, LGU, Tourism Office, community	Could support conservation and local roles if transparent and authorized.
Visitor use	Use behavior rules, signage, waste controls, visitor counts and incident logs; assess ecological indicators.	Site staff, Tourism Office, DENR/PAMB, CCSU, guides	May help identify pressures; effects still require measurement.
Infrastructure	Prioritize sanitation, water, waste systems and safe access where habitat safeguards and maintenance allow.	Mati City LGU, PAMB/DENR, City ENRO	May improve services without prioritizing growth.

Priority area	Recommended action	Responsible actors	Potential management value
Interpretation and livelihoods	Co-design mangrove interpretation and guide/nursery roles; assess training and benefit allocation.	University, schools, DENR, guides, community	Could link visitor learning with local roles; assess outcomes.

4. Conclusions

This study examined ecotourism activities, visitor and stakeholder perspectives, management constraints and the extent to which current arrangements reflect CBET principles at Guang-Guang Mangrove Park and Nursery. Visitors surveyed expressed favorable conservation attitudes and support for a conditional entrance fee, and stakeholder accounts described restoration, stewardship and potential livelihood roles. These results identify enabling conditions and perceived opportunities; they do not demonstrate conservation gains, income generation or equitable community benefits.

The case evidence also points to constraints in infrastructure and basic services, visitor interpretation and control, revenue arrangements, community influence over strategic decisions and coordination among institutions. Accordingly, Guang-Guang is best characterized as a multi-stakeholder, community-associated site where community involvement is present but stronger forms of shared authority and benefit-sharing are not established by the available data. For coastal conservation planning, visitor use should be integrated with mangrove safeguards, protected-area governance, clear institutional responsibilities, transparent authorized financing and meaningful community participation.

Management implications are to define ecological safeguards first, clarify institutional roles, strengthen community representation, resolve revenue rules transparently, monitor visitor use, provide compatible infrastructure and interpretation, and develop livelihood options with agreed benefit-sharing. Tourism scaling should be conditional on management capacity and ecological

monitoring. Broader ecological, economic and household-level research is needed to assess visitor impacts, carrying capacity, actual benefit distribution and livelihood effects before conclusions about long-term sustainability or community empowerment can be drawn.

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