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COMMUNITY ENGAGEMENT IN SOLID WASTE MANAGEMENT FOR SUSTAINABLE COASTAL TOURISM: A CASE STUDY OF BARANGAY GUMASA, GLAN, SARANGANI PROVINCE

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ABSTRACT
This study investigates the role of community engagement in strengthening solid waste management (SWM) practices and promoting sustainable coastal tourism in Barangay Gumasa, Glan, Sarangani Province. Using survey data from residents living along the coastal zone, the study found exceptionally high levels of community participation in SWM: 93.2% regularly join clean-up activities, 100% practice waste segregation and demonstrate full awareness of SWM policies, 88.6% attend SWM-related meetings, and 95.5% volunteer in SWM initiatives. These findings illustrated a deeply embedded culture of environmental stewardship that aligns with the mandates of RA 9003. Effective community participation was associated with positive tourism outcomes, including high beach cleanliness ratings, reduced tourist complaints, and increased perception that SWM contributes to tourism-derived income. Results further show that robust LGU–community cooperation supports consistent enforcement and implementation of SWM practices, reinforcing international models linking community-driven governance with sustainable tourism. Nonetheless, the barangay continues to face challenges, particularly waste surges during peak tourism events such as the SarBay Festival. Addressing these seasonal pressures through improved facilities, partnerships, and enforcement mechanisms is essential to sustaining tourism gains. Overall, the study underscores that when communities actively participate in environmental management, coastal tourism and local economic development can reinforce each other in a mutually beneficial cycle.

Keywords:
SWM, Solid Waste Management, Coastal Tourism

INTRODUCTION

Coastal tourism is a critical driver of local economies in the Philippines, but it also intensifies environmental pressures, particularly in solid waste generation. Barangay Gumasa—popularly known as the “Boracay of the South”—is a premier destination in Sarangani Province, attracting thousands of visitors annually. Despite its popularity, the barangay faces persistent waste management challenges common to many coastal tourism communities in the Philippines.

Prior research across Mindanao and comparable international sites underscores that environmental awareness alone does not guarantee environmentally sound behavior. Effective SWM requires strong community participation, consistent policy enforcement, local government commitment, and institutional support. In the context of Barangay Gumasa, there is a need to empirically examine how community engagement in SWM translates into environmental protection and tourism sustainability.

This study aims to fill this gap by investigating how community involvement in SWM influences coastal tourism sustainability. Using a descriptive-correlational approach, it evaluates participation levels, assesses SWM practices, examines tourism indicators, and identifies governance and institutional factors that support or hinder sustainable outcomes. The findings aim to guide policymakers, LGUs, and environmental stakeholders in ensuring that tourism development does not compromise ecological integrity.

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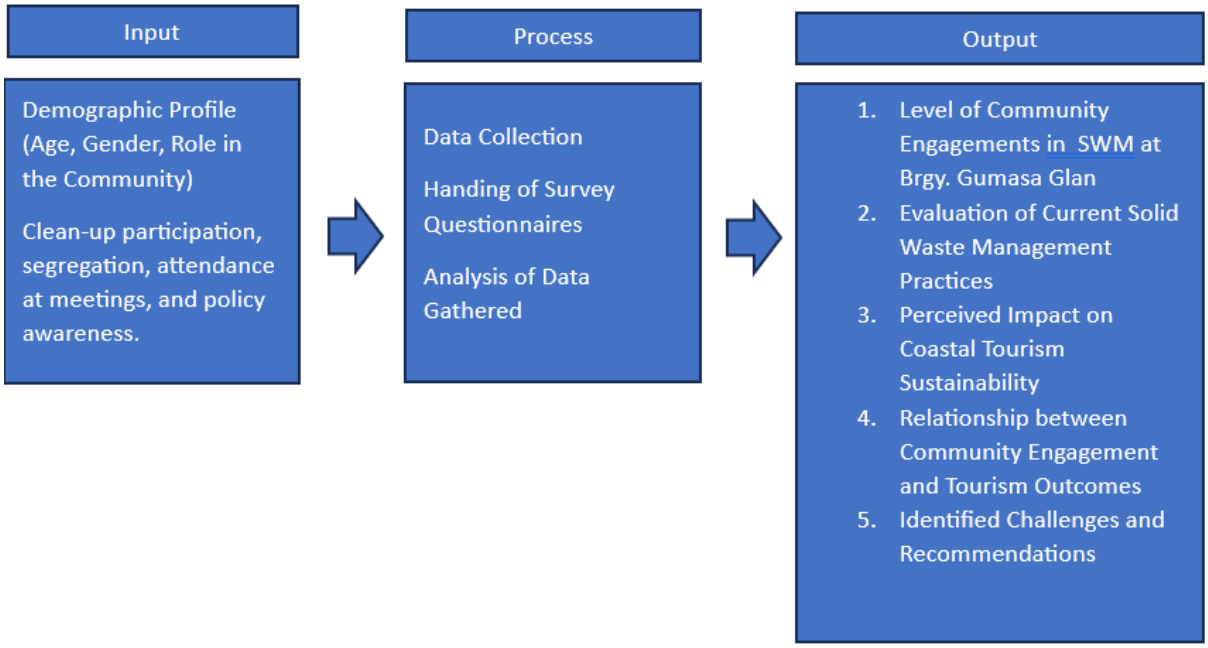
The general objective of this study is to examine how community engagement in solid waste management (SWM) influences the sustainability of coastal tourism in Barangay Gumasa, Glan, Sarangani Province. Specifically, it aims the following:

1. To assess the level of community engagement in solid waste management in terms of participation in clean-up drives, waste segregation, attendance in SWM meetings, and awareness of local SWM policies.
2. To evaluate solid waste management practices in Barangay Gumasa based on waste collection frequency, segregation compliance, ordinance enforcement, and barangay support.
3. To determine the perceived impact of SWM on coastal tourism sustainability with respect to tourist satisfaction, beach cleanliness, tourism-related livelihoods, and eco-tourism practices.
4. To identify challenges and opportunities in enhancing community-based SWM for sustainable coastal tourism.

This study used the Input–Process–Output (IPO) framework to examine how community engagement influences SWM performance and tourism sustainability. The Input pertains to the level of community engagement in terms of clean-up participation, segregation, attendance at meetings, and policy awareness. Naidu et al. (2021) emphasize that public involvement and environmental awareness are central to effective SWM. As to the Process, the Implementation of SWM practices includes waste collection systems, segregation compliance, ordinance enforcement, and barangay support. Effective governance, according to Wang, Lee, and Mokhtar (2021), strengthens waste management outcomes. Lastly, the Output deals on the resulting impact on coastal tourism as to beach cleanliness, tourist satisfaction, livelihood benefits, and eco-tourism promotion—as supported by Sutanto (2019). This framework posits that community participation is a central driver of environmental and economic sustainability in coastal destinations.

Figure 1. Conceptual Framework



METHODOLOGY

Research Design and Respondents

A descriptive-correlational design was used. The study was conducted in Barangay Gumasa, Glan, a coastal tourism hub known for its white-sand beaches and the annual Sarangani Bay Festival. A purposive sample of 44 respondents—residents, barangay officials, SWM implementers, and tourism business operators—was selected to ensure that all participants were individuals directly involved in or affected by SWM and tourism activities.

Data Gathering and Analysis

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A structured survey questionnaire was used to collect data on community engagement (input), SWM practices (process), and tourism indicators (output). Descriptive statistics (frequencies, percentages, means) and correlation analysis were applied to determine patterns and relationships. Ethical requirements—permission from local authorities, informed consent, and confidentiality—were strictly observed.

RESULTS AND DISCUSSION

Profile of Respondents

Of the 44 participants, 86.4% were residents, 11.4% tourism business owners, and 6.8% barangay officials. The gender distribution was nearly balanced (52.3% male; 47.7% female). The mean age was 38.6 years, reflecting a broad demographic representation.

1. Level of Community Engagement in SWM

Table 1 indicates exceptionally high community engagement in Barangay Gumasa, with participation in clean-up drives at 93.2%, universal practice of waste segregation (100%), and high awareness of SWM policies (100%). Attendance in SWM meetings (88.6%) and strong volunteerism (95.5%) further reflect a deeply rooted environmental culture.

Such high engagement suggests that the community possesses a strong sense of environmental stewardship, likely fueled by the barangay's economic reliance on coastal tourism. Research demonstrates that communities economically dependent on ecosystem services exhibit greater environmental participation (Pretty, 2003; Ostrom, 2009).

In the Philippine context, effective community involvement in coastal resource management has been linked with improved environmental outcomes (Alcala & Russ, 2006; DENR-UNEP, 2015). The compliance of Gumasa with RA 9003 also exceeds the engagement levels seen in other municipalities, where implementation remains uneven due to lack of awareness or weak enforcement (MMSU, 2019; Rebancos, 2013).

Barangay Gumasa's high engagement is consistent with findings that community-based governance increases buy-in, compliance, and long-term sustainability (Khalil et al., 2019). The strong turnout in SWM activities demonstrates a social norm of environmental responsibility, supporting the premise that social cohesion and collective action greatly enhance environmental governance.

Table 1: Descriptive Statistics for Community Engagement

Indicator	Frequency (n)	Percentage (%)	Mean/Modal Response
Clean-up Participation (Always)	41	93.2%	Always
Practice Waste Segregation (Yes)	44	100%	Yes
Aware of SWM Policies (Fully Aware)	44	100%	Fully Aware
Attended SWM Meetings (Yes)	39	88.6%	Yes
Volunteered in Initiatives (Yes)	42	95.5%	Yes

2. Solid Waste Management Practices

The barangay exhibits highly functional SWM performance. Regular garbage collection is practiced weekly by 88.6% of households, while 100% report access to segregated bins. Household-level recycling/composting is at 97.7%, SWM enforcement at 93.2%, and perceived adequacy of LGU support at 90.9%.

These findings reveal effective translation of RA 9003 mandates into household and community practice. According to the National Solid Waste Management Commission (NSWMC, 2020), segregation at source and household composting are the most difficult components for LGUs to sustain; yet in Gumasa, these practices appear fully adopted.

Studies show that LGU–community synergy is the strongest predictor of successful SWM (Cointreau, 2017; David et al., 2019). Gumasa reflects this relationship: strong LGU support appears to have created an enabling environment for high household compliance.

The barangay's high-performance SWM system mirrors international best practices, where consistent collection services, segregation systems, and community participation lead to reduced litter and improved environmental

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quality (UNEP, 2018). The data suggests that the barangay has institutionalized a stable SWM culture, indicating both administrative capacity and sustained behavioral change. Table 2 shows the descriptive statistics for SWM practices.

Table 2: Descriptive Statistics for SWM Practices

Indicator	Frequency (n)	Percentage (%)	Mean/Modal Response
Garbage Collection (Weekly)	39	88.6%	Weekly
Segregated Bins Present (Yes)	44	100%	Yes
Recycle/Compost Waste (Yes)	43	97.7%	Yes
Rules Enforced (Strictly)	41	93.2%	Strictly
Enough LGU Support (Agree/Strongly Agree)	40	90.9%	Strongly Agree

3. Perceived Impact of SWM on Coastal Tourism Sustainability

Findings under table 3 show that 72.7% of respondents rate the beach as "very clean," while 65.9% note that tourists "never" complain about waste issues. All respondents (100%) believe SWM improves tourism income and that eco-tourism practices are present.

These results reflect the widely documented connection between environmental quality and tourism competitiveness. Clean beaches significantly influence tourist satisfaction and return visits (Raj & Griffin, 2015; Romer & Filion, 2018). In the Philippines, coastal cleanliness has been shown to directly affect visitor volume in Boracay, Palawan, and Siargao (DOT, 2022; DENR, 2019).

Respondents' perceptions align with the sustainable tourism framework of the UN World Tourism Organization (UNWTO), where waste management is a core pillar of tourism sustainability (UNWTO, 2020).

The overwhelmingly positive perception suggests that the community understands the economic–environmental linkage, reinforcing the idea that SWM serves both ecological protection and tourism development. This matches findings that local communities with tourism-dependent livelihoods develop stronger support for environmental programs (Archer et al., 2014).

Table 3: Descriptive Statistics for Tourism Impact

Indicator	Frequency (n)	Percentage (%)	Mean/Modal Response
Beach Cleanliness (Very Clean)	32	72.7%	Very Clean
Tourists Complain (Never)	29	65.9%	Never
Boosted Tourism Income (Yes)	44	100%	Yes
Eco-tourism Practices Present (Yes)	44	100%	Yes

4. Relationship Between Community Engagement and Tourism Outcomes

The dataset's limited variability although hinders strong statistical correlation, the pattern clearly aligns with the conceptual model, as to;

High Community Engagement → Effective SWM → Strong Tourism Outcomes

This relationship mirrors the Input–Process–Output (IPO) framework used in community-based environmental management. High engagement generates more effective SWM practices, which in turn maintain the environmental quality required for tourism attractiveness.

Empirical studies support this linkage that Community-driven environmental initiatives are strongly associated with improved tourism sustainability in coastal destinations (Giampiccoli & Mtapuri, 2014; Mensah, 2016). Philippine coastal barangays that institutionalized community engagement—such as Apo Island and San Vicente—show improved waste management and increased tourism benefits (Alcala & Russ, 2006; DENR-UNDP, 2018).

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The case of Gumasa supports global and local literature suggesting that community involvement is the backbone of sustainable coastal tourism, especially in developing countries. Strong engagement leads to governance efficiency, which then enhances environmental assets that attract tourists.

Identified Challenges and Recommendations

Despite the overall strong performance of Barangay Gumasa in solid waste management (SWM) and community engagement, respondents identified several persistent challenges that threaten long-term sustainability. The most frequently mentioned concern was the influx of waste during peak tourist seasons, particularly during large events such as the SarBay Festival. This trend mirrors findings by Mensah (2016), who noted that tourism surges significantly increase waste generation in coastal destinations, often overwhelming local SWM capacity and affecting tourist experience and environmental quality.

Respondents also noted inadequate waste facilities and episodes of weak enforcement of waste-related rules. Similar limitations were documented in other Philippine coastal communities where RA 9003 implementation remains uneven due to financial, technical, and institutional constraints (Rebancos, 2013; NSWMC, 2020).

To address these issues, respondents recommended several strategies:

1. Strengthened information, education, and communication (IEC) initiatives – consistent with Cointreau (2017), who emphasized community awareness as a key predictor of SWM success.
2. Enhanced community clean-up activities, especially during high-tourism months, aligned with globally recognized community-driven coastal stewardship efforts (UNEP, 2018).
3. Partnerships with NGOs and government agencies to improve access to resources, training, and waste infrastructure—reflecting Ostrom's (2009) proposition that multi-level collaboration improves collective environmental outcomes.
4. Stricter enforcement of SWM ordinances, which aligns with studies showing that compliance improves when local authorities demonstrate consistent regulatory presence (David et al., 2019).

These recommendations reveal a community that is not only aware of its vulnerabilities but is also actively seeking both internal capacity building and external institutional support to strengthen its SWM system. This reflects the principles of community-based tourism and environmental co-management, where empowered communities demonstrate readiness to collaborate for resilience and sustainability (Giampiccoli & Mtapuri, 2014).

CONCLUSION

The case of Barangay Gumasa demonstrates a compelling example of effective community-based solid waste management in a coastal tourism setting. The exceptionally high levels of participation, awareness, and compliance observed in the study indicate a community that understands the direct relationship between environmental quality and tourism-driven economic benefits—consistent with sustainable tourism models (Raj & Griffin, 2015; UNWTO, 2020).

The strong synergy between the community and the LGU, characterized by active enforcement and consistent logistical support, reflects the operationalization of RA 9003 at the barangay level. As theorized by Pretty (2003) and Ostrom (2009), such collaborative governance structures often yield durable environmental outcomes.

However, the recurrent challenge of seasonal waste surges—particularly during major tourism events—remains a priority concern. If unaddressed, fluctuating waste loads may strain existing systems and undermine visitor satisfaction, similar to patterns seen in other Asian beach destinations (Romer & Filion, 2018). Strategic interventions focusing on event-based waste management planning, expanded facilities, and strengthened enforcement can help mitigate these risks.

Overall, Barangay Gumasa illustrates how environmental stewardship and tourism development can reinforce each other when communities are empowered, systems are well-managed, and policies such as RA 9003 are meaningfully localized. The experience of Gumasa shows that sustainable tourism is achievable when the community recognizes that protecting its coastal environment directly contributes to its long-term economic prosperity—a virtuous cycle aligned with global sustainable development frameworks.

REFERENCES

[1] Alcala, A. C., & Russ, G. R. (2006). *No-take marine reserves and reef fisheries management in the Philippines: A new people power revolution*. AMBIO, 35(5), 245–254.
[2] Archer, B., Cooper, C., & Ruhanen, L. (2014). *The positive and negative impacts of tourism*. In J. Jafari & H. Xiao (Eds.), Encyclopedia of Tourism (pp. 679–683). Springer.

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[3] Camarillo, J. M. *Community participation and compliance with Republic Act 9003 in solid waste management implementation*. Philippine Journal of Public Administration, 65(2), 145–163.
[4] Cointreau, S. (2017). *Solid waste management: Sustainable practices in lower-income countries*. World Bank Publications.
[5] David, C. P., Gonzales, A., & Ballesteros, M. (2019). *Solid Waste Management in the Philippines: Problems and Solutions*. Philippine Institute for Development Studies (PIDS) Discussion Paper Series.
[6] Delfin, R. P., Cruz, M. J., & Villanueva, L. G. *Marine plastic pollution and its implications for coastal tourism in Barobo, Surigao del Sur*. Philippine Journal of Environmental Science and Management, 29(1), 55–66.
[7] DENR (Department of Environment and Natural Resources). (2019). *Rehabilitation and carrying capacity assessment of major Philippine tourist destinations*. DENR-PAMB Reports.
[8] DENR–UNDP. (2018). *Coastal and Marine Ecosystems Management Program (CMEMP) Assessment Report*. Department of Environment and Natural Resources & United Nations Development Programme.
[9] DENR–UNEP. (2015). *Integrated Coastal Management for Sustainable Development: Philippines Country Report*. DENR & United Nations Environment Programme.
[10] DOT (Department of Tourism). (2022). *Tourism Statistics and Environmental Management Report*. Department of Tourism–Philippines.
[11] Giampiccoli, A., & Mtapuri, O. (2014). *Community-based tourism: An exploration of the relationship between community engagement and sustainable tourism development*. African Journal for Physical Health Education, Recreation and Dance, 20(3), 948–965.
[12] Khalil, R., Khan, K. M., & Khan, A. (2019). *Community participation and environmental sustainability: The role of community-based organizations*. Journal of Environmental Management, 237, 44–52.
[13] Lomanta, J. P. (2023). *Awareness and compliance with solid waste management practices among residents in coastal barangays of Mati, Davao Oriental.* Mindanao Journal of Social Research, 15(2), 23–34.
[14] Mensah, I. (2016). *Effects of sanitation practices on tourism development: Evidence from developing countries.* Journal of Tourism and Hospitality Research, 16(3), 257–270.
[15] MMSU (Mariano Marcos State University). (2019). *Assessment of RA 9003 implementation in selected municipalities in Ilocos Norte*. MMSU Research and Extension Journal.
[16] Nasdee, T., Thongdee, S., & Chanprasert, P. (2023). *Community-based solid waste management in small island tourism: A case study of Koh Phayam, Thailand*. Journal of Environmental Management and Tourism, 14(3), 812–824. https://doi.org/10.14505/jemt.v14.3(67).14
[17] NSWMC (National Solid Waste Management Commission). (2020). *RA 9003 Implementation Status Report*. Quezon City: NSWMC-EMB.
[18] Ostrom, E. (2009). *A general framework for analyzing sustainability of social-ecological systems*. Science, 325(5939), 419–422.
[19] Pretty, J. (2003). *Social capital and the collective management of resources*. Science, 302(5652), 1912–1914.
[20] Raj, R., & Griffin, K. (2015). *Principles and practices of sustainable tourism: A sustainability perspective*. CABI Publishing.
[21] Rebancos, C. M. (2013*). Community attitudes and practices on solid waste management in coastal municipalities in the Philippines*. Asia Pacific Journal of Multidisciplinary Research, 1(1), 35–44.
[22] Republic Act No. 9003. (2000). Ecological Solid Waste Management Act of 2000. Official Gazette of the Republic of the Philippines. https://www.officialgazette.gov.ph/2001/01/26/republic-act-no-9003
[23] Romer, D., & Filion, F. L. (2018). *Tourists' perceptions of beach cleanliness and the influence on destination choice*. Journal of Sustainable Tourism, 26(12), 2079–2095.
[24] UNEP (United Nations Environment Programme). (2018). *Solid waste management in coastal areas: Global best practices*. UNEP Publishing.
[25] UNWTO (United Nations World Tourism Organization). (2020). *Sustainable tourism development guidelines for coastal destinations*. UNWTO Publications.