

EFFECTIVENESS OF THE SUSTAINABLE TOURISM PRACTICES ON MARINE ECOTOURISM IN WESTERN PANGASINAN

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ABSTRACT

Marine ecotourism has emerged as a vital sector in sustainable tourism, particularly in coastal regions where biodiversity and livelihoods are closely intertwined. This study aimed to investigate the effectiveness of the sustainable tourism practices on marine ecotourism in Western Pangasinan, focusing on the City of Alaminos and Municipality of Bolinao, two areas renowned for their rich marine ecosystems and tourism potential. Using a descriptive research design, data were gathered from 385 respondents (male – 228; female-157), including residents, tourists, tourism personnel/environmental officers, tour guides, and boatmen, through random sampling and survey questionnaires.

The research explores the level of awareness, challenges, and opportunities in implementing sustainable tourism practices, as well as their impacts on marine ecosystems and local communities. Findings highlight that both municipalities have adopted diverse sustainable tourism practices such as regular water quality monitoring, mangrove rehabilitation, coastal clean-ups, eco-friendly infrastructure, and livelihood programs. These practices contribute significantly to marine conservation, community empowerment, and enhanced visitor experiences. However, persistent challenges such as pollution, habitat degradation, overfishing, overcrowding, and climate change continue to threaten the sustainability of marine ecotourism.

Results underscore the importance of inclusive stakeholder participation, policy support, and continuous education in strengthening sustainable tourism. This study concludes that while current sustainable tourism practices in the City of Alaminos and Municipality of Bolinao demonstrate positive impacts, their long-term effectiveness depends on integrated strategies that balance and support environmental preservation, economic benefits, and social responsibility. This research provides valuable insights for policymakers, tourism stakeholders, and future researchers in advancing sustainable tourism practices on marine ecotourism in Western Pangasinan and beyond.

Keywords: Sustainable Tourism, Marine Ecotourism, Environmental Management, Habitat Conservation, Sustainable Practices, Heritage Site Management

INTRODUCTION

Coastal and maritime tourism rely on healthy marine ecosystems. Thus, tourism development should be an integral part of the management of these environments to help conserve and preserve fragile marine ecosystems and serve as a vehicle to promote a blue economy, contributing to the sustainable use of marine resources.

According to Tourism in the 2030 Agenda, in some destinations, marine resources are the main source of income; their protection is crucial. The economic benefits of tourism in relation to life below water of the Sustainable Development Goals have been further solidified by the explicit mention of tourism. This study focuses on the effectiveness of sustainable tourism practices on marine ecotourism in the City of Alaminos and Municipality of Bolinao, located in Western Pangasinan. These municipalities are known for their rich marine biodiversity, picturesque coastal areas, and growing interest in marine ecotourism. Western Pangasinan continues to attract tourists; the implementation of sustainable tourism practices is crucial to ensure the preservation of the marine ecotourism while promoting long-term economic benefits. This study explores how sustainable tourism practices are being implemented in these municipalities and evaluates their impact on the marine ecosystem, local communities, and the tourism industry.

Despite the growing recognition of the importance of sustainable tourism practices on marine ecotourism, there remains a significant gap in empirical research specifically addressing the effectiveness of the sustainable tourism practices on marine ecotourism in Western Pangasinan. While the existing literature highlights the economic benefits of marine ecotourism and its potential to contribute to the sustainable use of marine resources, there is limited understanding of how these practices are operationalized at the local level and their direct impacts on marine ecosystems and local communities. Additionally, while the concept of marine ecotourism is well-established, there is a need for more nuanced investigations into the existing sustainable practices being implemented and their effectiveness in conserving marine biodiversity.

The study aims to know the different sustainable tourism practices in the City of Alaminos and Municipality of Bolinao, where the tourist spots and destinations in Western Pangasinan were maintained through sustainable practices, evaluating their effectiveness in promoting marine conservation, supporting local economies, and enhancing the overall sustainability of marine ecotourism. In addition, through the years where Pangasinan is known for a lot of beautiful and pristine beaches, conducting this study would create a discovery and knowledge for all, especially to the local municipalities, where each of them is implementing different actions to sustain and promote their very own tourist spot or destination.

METHODS

The researchers wanted to determine the Effectiveness of sustainable tourism practices on Existing Marine Ecotourism in Western Pangasinan. Two methods are used in this study: the Quantitative Research Method and the Descriptive Research Design, which are aimed at determining the extent of implementation of sustainable tourism practices and the level of effectiveness of marine ecotourism in the selected municipalities. This allows the researcher to make informed and systematic decisions based on the opinion received and take appropriate actions to address any concerns or issues that may arise during the study.

The study will be conducted in the local tourism spots with sustainable tourism practices on marine ecotourism in the City of Alaminos and also in the Municipality of Bolinao. These two selected municipalities were chosen for this study because, as evidenced by several online and offline marketing campaigns, they are gradually becoming well-known for their respective tourist destinations, and they are the only municipalities in Western Pangasinan that have existing marine ecotourism. Other areas in Western Pangasinan weren't included because it's not yet developed and totally established compared to the two striving towns, which are the City of Alaminos and Municipality of Bolinao.

The Percentage, Frequency, and Likert Scale were used as statistical procedures to interpret the data gathered from the study's respondents.

RESULTS

The results section presents all the gathered data from the respondents, which provides relevant and substantial information in accomplishing the purpose of the study. The presentation, analysis, and interpretation of data gathered paved the way for the research study. Part I presents four tables to show the profile of the respondents; for the second part, the sustainable tourism practices on marine ecotourism are presented in two tables. The third part presented the Challenges and Opportunities in Implementing Sustainable Tourism Practices on Marine Ecotourism, and the fourth part presented the Effect of Marine Ecotourism Activities on Coastal and Marine Ecosystems, and the final part includes two tables for the Effectiveness of Sustainable Tourism Practices in the City of Alaminos and Municipality of Bolinao.

SUSTAINABLE TOURISM PRACTICES ON MARINE ECOTOURISM

Table 1

Sustainable Tourism Practices on Marine Ecotourism in the City of Alaminos

	Indicators			5	4	3	2	1	Mean	DR
				F %	F %	F %	F %	F %		
1.	Regular	Water	Quality	109	63	18	2	0	4.44	Highly
	Monitoring			56.48%	32.64%	9.33%	1.55%	0.00%		Aware
2.	Mangrove Rehabilitation			122	55	12	4	0	4.53	Highly
				63.21%	28.50%	6.22%	2.07%	0.00%		Aware
3.	Propagation and Planting			137	39	14	3	0	4.61	Highly
				70.98%	20.21%	7.25%	1.55%	0.00%		Aware
4.	Beach and	Native	Tree	128	45	16	4	0	4.54	Highly
	Planting			66.32%	23.32%	8.29%	2.07%	0.00%		Aware
5.	Scubasurero	or	Underwater	154	28	9	2	0	4.73	Highly
	Clean-up Drives			79.79%	14.51%	4.66%	1.04%	0.00%		Aware
6.	Coastal and River	Clean-up		162	22	9	0	0	4.79	Highly
	Activities			83.94%	11.40%	4.66%	0.00%	0.00%		Aware
7.	Zumbasurero			111	51	22	9	0	4.37	Highly
				57.51%	26.42%	11.40%	4.66%	0.00%		Aware

AWM: 4.57% (Highly Aware)

Legend: 4.21-5.00 (Highly Aware); 3.41-4.20 (Aware); 2.61-3.40 (Somewhat Aware); 1.81-2.60 (Unaware); 1.00-1.80 (Highly Unaware)

As presented in Table 1, the average weighted mean (AWM) of the Sustainable Tourism Practices on Marine Ecotourism in the City of Alaminos was 4.57 % with a descriptive rating of “Highly Aware. All other indicators are also classified as “Highly Aware” on the Sustainable Tourism Practices on Marine Ecotourism in the City of Alaminos. Among the indicators, indicator 6 “Coastal and River Clean-up Activities” in the City of Alaminos, obtained the highest mean, which was 4.79%. This was followed by the indicator 5 “Scubasurero or Underwater Clean-up Drives” with the mean of 4.73%, and indicator 3 “Propagation and Planting,” which obtained the third highest mean score of 4.61% which is. Next in rank was indicator 4, “Beach and Native Tree Planting,” which obtained the mean of 4.54%. Other indicators, such as indicator 2 “Mangrove Rehabilitation” with 4.53%, and indicator 1 “Regular Water Quality Monitoring” obtained 4.44%, were slightly lower. Meanwhile, Indicator 7 “Zumbasurero” registered the lowest mean score of 4.37%, though it likewise remained within the “Highly Aware” on descriptive rating. Respondents strongly agreed on the Sustainable Tourism Practices on Marine Ecotourism in the City of Alaminos. These support the findings of Warguez, K. A., Gomez, A. L. V., Montiflor, M. O., Aguinaldo, R. T., & School of Management, University

of the Philippines Mindanao, Mintal, Tugbok District, Davao City 8022, Philippines. (2023). Findings revealed that there was general community awareness of regulations and positive views towards participating in CRM initiatives. Results further showed that socio-demographics, boat ownership, perceived effectiveness of regulations, local government unit as a source of information, and awareness and previous participation in CRM efforts were the important predictors of participation in CRM efforts.

Table 2
Sustainable Tourism Practices on Marine Ecotourism in the Municipality of Bolinao

	Indicators	5 F %	4 F %	3 F %	2 F %	1 F %	Mean	DR
1	Eco-Friendly Infrastructure	110 57.29%	75 39.06%	7 3.65%	0 0.00%	0 0.00%	4.54	Highly Aware
2	Sustainable Visitor Management	99 51.56%	80 41.67%	13 6.77%	0 0.00%	0 0.00%	4.45	Highly Aware
3	Collaboration with National Agencies	105 54.69%	70 36.46%	17 8.85%	0 0.00%	0 0.00%	4.46	Highly Aware
4	Giant Clam Protection	110 57.29%	69 35.94%	8 4.17%	5 2.60%	0 0.00%	4.48	Highly Aware
5	Tour Guide Empowerment	110 57.29%	70 36.46%	11 5.73%	1 0.52%	0 0.00%	4.51	Highly Aware
6	Branding with local core: Mascots “Bolido” and “Anao”	93 48.44%	73 38.02%	19 9.90%	7 3.65%	0 0.00%	4.31	Highly Aware
7	Livelihood Programs	105 54.69%	74 38.54%	12 6.25%	1 0.52%	0 0.00%	4.47	Highly Aware

AWM: 4.46% (Highly Aware)

Legend: 4.21-5.00 (Highly Aware); 3.41-4.20 (Aware); 2.61-3.40 (Somewhat Aware); 1.81-2.60 (Unaware); 1.00-1.80 (Highly Unaware)

As presented in Table 2, the data reveal that the Sustainable Tourism Practices on Marine Ecotourism in the Municipality of Bolinao had an average weighted mean (AWM) was 4.46% with a descriptive rating of “Highly Aware”. All other indicators are also classified as “Highly Aware” on the Sustainable Tourism Practices on Marine Ecotourism in the Municipality of Bolinao. Among the indicators, a large portion and the highest mean was indicator 1, “Eco-Friendly Infrastructure,” in the Municipality of Bolinao, which obtained 4.54%. This was followed by indicator 5 “Tour Guide Empowerment,” which obtained 4.51%, followed by indicator 4 “Giant Clam Protection,” which obtained the third highest mean score, ranking 4.48%. Next in rank was indicator 7 “Livelihood Programs” with a mean score of 4.47%. Meanwhile, 4.46% mean score of indicator 3 “Collaboration with National Agencies, 4.45% came from indicator 2 “Sustainable Visitor Management.” However, indicator 6 “Branding with local core: Mascots “Bolido” and “Anao” yielded the lowest mean score of 4.31%, interpreted as “Highly Aware. This shows that most of the respondents revealed that they are highly aware of the sustainable tourism practices on marine ecotourism in the Municipality of Bolinao. These findings aligned with the study of Hernandez, C. N., Dunton, M. B., Panes, M. A. T., & Torres, F. R. L. (2022) that the Southern Iloilo paper shows that awareness among stakeholders correlates with sustainable practices. This parallels your assumption that high awareness in Bolinao (e.g., infrastructure, livelihood, marine protection) likely translates into adherence.

CHALLENGES AND OPPORTUNITIES IN IMPLEMENTING SUSTAINABLE TOURISM PRACTICES ON MARINE ECOTOURISM

Table 3

Challenges and Opportunities in Implementing Sustainable Tourism Practices on Marine Ecotourism

Indicators	5	4	3	2	1	Mean	DR
CHALLENGES	F %	F %	F %	F %	F %		
1. Climate change affects coral reefs and marine biodiversity.	237 61.56%	128 33.25%	19 4.94%	1 0.26%	0 0.00%	4.56	Strongly Agree
2. Loss of mangroves and coastal habitats, caused by typhoons, strong water currents, and other neutral phenomena on marine biodiversity and weakens coastal protection.	235 61.04%	123 31.95%	27 7.01%	0 0.00%	0 0.00%	4.54	Strongly Agree
3. Contaminants from households, boats, and other sources threaten marine ecosystems and human health.	237 61.56%	119 30.91%	28 7.27%	1 0.26%	0 0.00%	4.54	Strongly Agree
4. Lack of community awareness and participation, some local residents and tourists are not fully aware of sustainable practices, which may lead to waste management problems and pollution.	225 58.44%	114 29.61%	41 10.65%	3 0.78%	2 0.52%	4.45	Strongly Agree
5. Gathering of waste in coastal and marine areas is due to the improper handling and disposal of garbage.	237 61.56%	121 31.43%	23 5.97%	4 1.04%	0 0.00%	4.54	Strongly Agree
6. Unclear zoning policies affect the marine ecosystem protection in coastal areas.	223 57.92%	135 35.06%	25 6.49%	4 1.04%	0 0.00%	4.51	Strongly Agree
7. Overcrowding contributes to the degradation of marine biodiversity.	225 58.44%	125 32.47%	32 8.31%	2 0.52%	1 0.26%	4.48	Strongly Agree
8. Pollution from tourist activities poses a serious threat to coastal ecosystems.	232 60.26%	118 30.65%	30 7.79%	4 1.04%	1 0.26%	4.50	Strongly Agree
OPPORTUNITIES							
9. The tourism office and local government unit developed and implemented holistic and community-driven solutions that focus on environmental protection, education, and sustainable tourism.	245 63.64%	129 33.51%	11 2.86%	0 0.00%	0 0.00%	4.61	Strongly Agree
10. Sustainable ecotourism provide continuous livelihood opportunities for local communities.	235 61.04%	128 33.25%	20 5.19%	1 0.26%	1 0.26%	4.55	Strongly Agree
11. Sustainable ecotourism practices increase the awareness of environmental protection and responsible tourist behaviors among locals and tourists.	253 65.71%	112 29.09%	20 5.19%	0 0.00%	0 0.00%	4.61	Strongly Agree
12. Sustainable ecotourism practices create opportunities for partnerships among local government and the tourism sector to enhance marine conservation.	247 64.16%	114 29.61%	24 6.23%	0 0.00%	0 0.00%	4.58	Strongly Agree
13. Environmental education programs help tourists understand the importance of marine conservation.	266 69.09%	106 27.53%	13 3.38%	0 0.00%	0 0.00%	4.66	Strongly Agree
14. Adaptive management frameworks improve the resilience of marine ecotourism destinations.	238 61.82%	129 33.51%	18 4.68%	0 0.00%	0 0.00%	4.57	Strongly Agree
15. Collaboration between government, private sector, and communities leads to better tourism management.	265 68.83%	110 28.57%	10 2.60%	0 0.00%	0 0.00%	4.66	Strongly Agree
16. Community-driven conservation improves the protection and monitoring of marine ecotourism destinations.	254 65.97%	117 30.39%	13 3.38%	1 0.26%	0 0.00%	4.62	Strongly Agree

AWM: 4.56% (Strongly Agree)

Legend: 4.21-5.00 (Strongly Agree); 3.41-4.20 (Agree); 2.61-3.40 (Slightly Agree); 1.81-2.60 (Disagree); 1.00-1.80 (Strongly Disagree)

As presented in Table 3, the average weighted mean (AWM) of the Challenges and Opportunities in Implementing Sustainable Tourism Practices on Marine Ecotourism was 4.56% with a descriptive rating of “Strongly Agree”. There are 4.56% of our respondents strongly agreed that Challenges and Opportunities in Implementing Sustainable Tourism Practices on Marine Ecotourism and this supports the findings on the article of Sumeldan, J. D. C., Richter, I., Avillanosa, A. L., Bacosa, H. P., Creencia, L. A., & Pahl, S. (2021), explores coastal communities' perceptions of local environmental issues in Palawan, Philippines, highlighting how these perceptions have evolved. Results indicate optimism regarding trends in mangrove and beach tree cover, seagrass coverage, seaweed farming, and drinking water quality, which is similarly connected to the results of our Table 7. Their findings observed differences in perceptions based on geographic area, with recommendations to incorporate these views into resource management and policy-making.

EFFECT OF MARINE ECOTOURISM ACTIVITIES ON COASTAL AND MARINE ECOSYSTEMS

Table 4
Effect of Marine Ecotourism Activities on Coastal and Marine Ecosystems

Indicators	5 F %	4 F %	3 F %	2 F %	1 F %	Mean	DR
1. Marine ecotourism supports the conservation of coastal and marine ecosystems.	235 61.04%	129 33.51%	21 5.45%	0 0.00%	0 0.00%	4.56	Strongly Agree
2. Marine ecotourism encourages environmentally friendly practices, such as stopping destructive fishing.	231 60.00%	135 35.06%	19 4.94%	0 0.00%	0 0.00%	4.55	Strongly Agree
3. Marine ecotourism activities help increase public awareness about marine conservation.	232 60.26%	136 35.32%	17 4.42%	0 0.00%	0 0.00%	4.56	Strongly Agree
4. Tourist orientation and environmental briefings help protect coral reefs and marine habitats.	243 63.12%	128 33.25%	14 3.64%	0 0.00%	0 0.00%	4.59	Strongly Agree
5. Marine ecotourism activities creates and promote sustainable livelihoods.	243 63.12%	122 31.69%	19 4.94%	1 0.26%	0 0.00%	4.58	Strongly Agree
6. Environmental fees are used to support conservation and environmental programs.	238 61.82%	125 32.47%	21 5.45%	1 0.26%	0 0.00%	4.56	Strongly Agree
7. Activities in Marine Protected Areas (MPAs) help preserve natural resources.	251 65.19%	117 30.39%	17 4.42%	0 0.00%	0 0.00%	4.61	Strongly Agree
8. Well-managed marine ecotourism activities helps sustain environmental stewardship among tourists and locals.	255 66.23%	115 29.87%	15 3.90%	0 0.00%	0 0.00%	4.62	Strongly Agree

AWM:4.58% (Strongly Agree)

Legend: 4.21-5.00 (Strongly Agree); 3.41-4.20 (Agree); 2.61-3.40 (Slightly Agree); 1.81-2.60 (Disagree); 1.00-1.80 (Strongly Disagree)

As illustrated in Table 4, most of the respondents “Strongly Agree” on the Effect of Marine Ecotourism Activities on Coastal and Marine Ecosystems, with an Average Weighted Mean (AWM) of 4.58% on descriptive rating. The highest level of mean was indicator 8, “Well-managed marine ecotourism activities help sustain environmental stewardship among tourists and locals,” with a mean score of 4.62%, followed by indicator 7, “Activities in Marine Protected Areas (MPAs) help preserve natural resources,” which had a mean score of 4.61%. Meanwhile, indicator 4, “Tourist

orientation and environmental briefings help protect coral reefs and marine habitats,” received a mean score of 4.59%. Next in rank was indicator 5 “Marine ecotourism activities create and promote sustainable livelihoods” was also had a mean score of 4.58%. The indicators 1 “Marine ecotourism supports the conservation of coastal and marine ecosystems”, indicator 3 “Marine ecotourism activities help increase public awareness about marine conservation.”, and indicator 6 “Environmental fees are used to support conservation and environmental programs.” all shared an equal mean score of 4.56% and were categorized as “Strongly Agree” rated. The indicator 2 “Marine ecotourism encourages environmentally friendly practices, such as stopping destructive fishing” gained the lowest mean score of 4.55% and remained “Strongly Agree” on the rating. Respondents strongly agreed on the Effect of Marine Ecotourism Activities on Coastal and Marine Ecosystems highlights the findings of Ballard, E. L., Teruyuki, S., & Yoshinori, M. (2021) that respondents acknowledge ecotourism's effects on family welfare, fishing activities, and their role in Marine Protected Area (MPA) management who emphasizes that ecotourism can enhance community support for coastal resource management, particularly when it generates sufficient income. The findings aim to inform resource managers and policymakers in developing sustainable ecotourism and alternative livelihood strategies that consider potential impacts on coastal fishing communities.

EFFECTIVENESS OF SUSTAINABLE TOURISM PRACTICES

Table 5
Effectiveness of Sustainable Tourism Practices in the City of Alaminos

Indicators	5 F %	4 F %	3 F %	2 F %	1 F %	Mean	DR
Regular Water Quality Monitoring	142	43	8	0	0	4.69%	Strongly Agree
The regular water quality monitoring is effective in maintaining clean water in tourist areas.	73.58%	22.28%	4.15%	0.00%	0.00%		
Mangrove Rehabilitation	137	48	8	0	0	4.67%	Strongly Agree
Mangrove rehabilitation supports biodiversity and provides habitats for marine life.	70.98%	24.87%	4.15%	0.00%	0.00%		
Propagation and Planting	146	39	8	0	0	4.72%	Strongly Agree
The propagation and planting is effectively raising environmental awareness among locals and tourists.	75.65%	20.21%	4.15%	0.00%	0.00%		
Beach and Native Tree Planting	131	54	8	0	0	4.64%	Strongly Agree
These planting practice are effective in preserving marine and coastal environment.	67.88%	27.98%	4.15%	0.00%	0.00%		
Scubasurero or Underwater Clean-up Drives	143	44	6	0	0	4.71%	Strongly Agree
Regular underwater clean-up activities are property maintained and implemented on the coral reefs and marine ecosystems.	74.09%	22.80%	3.11%	0.00%	0.00%		
Coastal and River Clean-up Activities	145	43	5	0	0	4.73%	Strongly Agree
These clean-up activities are effective in reducing pollution and improving water quality in coastal and river areas.	75.13%	22.28%	2.59%	0.00%	0.00%		
Zumbasurero	131	51	11	0	0	4.62%	Strongly Agree
The implementation of zumbasurero helps maintain and preserve the cleanliness of the destination.	67.88%	26.42%	5.70%	0.00%	0.00%		

AWM:4.68% (Strongly Agree)

Legend: 4.21-5.00 (Strongly Agree); 3.41-4.20 (Agree); 2.61-3.40 (Slightly Agree); 1.81-2.60 (Disagree); 1.00-1.80 (Strongly Disagree)

As presented in Table 5, the average weighted mean (AWM) of the Effectiveness of Sustainable Tourism Practices in the City of Alaminos was 4.68% and was recognized as “Strongly Agree” on the descriptive rating. Other indicators

are all classified “Strongly Agree” on the rating. The highest rating of mean was indicator 6 “Coastal and River Clean-up Activities. These clean-up activities are effective in reducing pollution and improving water quality in coastal and river areas”, attained a mean score of 4.73%. The next indicator was 3 “Propagation and Planting. The propagation and planting are effectively raising environmental awareness among locals and tourists, which has a mean score of 4.72%. Followed by indicator 5, “Scubasurero or Underwater Clean-up Drives. Regular underwater clean-up activities are property maintained and implemented on the coral reefs and marine ecosystems.” gained a mean score of 4.71%. Whereas, indicator 1 “Regular Water Quality Monitoring. The regular water quality monitoring is effective in maintaining clean water in tourist areas.” received a mean score of 4.69%. With a mean score of 4.67%, indicator 2 “Mangrove Rehabilitation. Mangrove rehabilitation supports biodiversity and provides habitats for marine life. In the same way, indicator 4, “Beach and Native Tree Planting. These planting practices are effective in preserving the marine and coastal environment,” received a slightly lower rating with a mean score of 4.64%. In addition, the indicator registered as the lowest rating, with a mean score of 4.62%, was indicator 7, “Zumbasurero. The implementation of Zumbasurero helps maintain and preserve the cleanliness of the destination” with the same descriptive rating of “Strongly Agree”.

Table 6
Effectiveness of Sustainable Tourism Practices in the Municipality of Bolinao

Indicators	5 F %	4 F %	3 F %	2 F %	1 F %	Mean	DR
Eco-friendly Infrastructure	104	81	7	0	0	4.51%	Strongly Agree
Eco-friendly infrastructure effectively minimize ecological disruption.	54.17%	42.19%	3.65%	0.00%	0.00%		
Sustainable Visitor Management	100	84	8	0	0	4.48%	Strongly Agree
These practice enhanced facilities designed to protect Silaki’s Giant Clam sanctuaries and coral reefs while improving tourist experiences.	52.08%	43.75%	4.17%	0.00%	0.00%		
Collaboration with national agencies	104	77	11	0	0	4.48%	Strongly Agree
Collaboration with national agencies is effectively implemented in the sustainable tourism initiatives.	54.17%	40.10%	5.73%	0.00%	0.00%		
Giant Clam Protection	106	72	12	0	0	4.45%	Strongly Agree
Monitoring and enforcement of giant clam protection rules are effectively carried out for recreational use.	55.21%	37.50%	6.25%	0.00%	0.00%		
Tour Guide Empowerment	112	71	9	0	0	4.54%	Strongly Agree
Accredited tour guides effectively promote sustainable tourism practices to tourists.	58.33%	36.98%	4.69%	0.00%	0.00%		
Branding with local core: Mascots “Bolido” and “Anao”	100	81	9	2	0	4.45%	Strongly Agree
Marketing materials through branding featuring “Bolido” and “Anao” are effectively disseminated to target tourists.	52.08%	42.19%	4.69%	1.04%	0.00%		
Livelihood Programs	114	73	4	1	0	4.56	Strongly Agree
Livelihood Programs are effectively implemented to promote sustainable and environmentally friendly practices.	59.38%	38.02%	2.08	0.52%	0.00%		

AWM: 4.50% (Strongly Agree)

Legend: 4.21-5.00 (Strongly Agree); 3.41-4.20 (Agree); 2.61-3.40 (Slightly Agree); 1.81-2.60 (Disagree); 1.00-1.80 (Strongly Disagree)

As presented in Table 6, the data shows the Effectiveness of Sustainable Tourism Practices in Municipality of Bolinao, which had an average weighted mean (AWM) was 4.50% with a descriptive rating of “Strongly Agree”. Other indicators are all classified “Strongly Agree” on the rating. The highest rating of mean was indicator 7, “Livelihood

Programs. Livelihood Programs are effectively implemented to promote sustainable and environmentally friendly practices,” attained a mean score of 4.56%. Similarly, indicator 5 “Tour Guide Empowerment. Accredited tour guides effectively promote sustainable tourism practices to tourists” received a mean score of 4.54%. Meanwhile, indicator 1, “Eco-friendly Infrastructure. Eco-friendly infrastructure effectively minimizes ecological disruption,” had a mean score of 4.51%. Together, both obtained a mean score of 4.48% on the rating, indicator 2 “Sustainable Visitor Management. These practices enhanced facilities designed to protect Silaki’s Giant Clam sanctuaries and coral reefs while improving tourist experiences.” and indicator 3 “Collaboration with national agencies. Collaboration with national agencies is effectively implemented in the sustainable tourism initiatives”. There are two indicators registered as the lowest ratings, indicator 4 “Giant Clam Protection. Monitoring and enforcement of giant clam protection rules are effectively carried out for recreational use” and indicator 6 “Branding with local core: Mascots “Bolido” and “Anao. Marketing materials through branding featuring “Bolido” and “Anao” are effectively disseminated to target tourists, which had a mean score of 4.45%, remaining the same rating of “Strongly Agree”.

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DECLARATION ON THE USE OF AI TOOLS

In conducting this research, no artificial intelligence (AI) techniques, technologies, or applications were utilized. Traditional research methods were used to collect, analyze, and interpret all of the data. These approaches included manual data collecting through questionnaires by different types of respondents in Western Pangasinan, and statistical analysis utilizing fundamental techniques, including descriptive statistics, which is the frequency and percentage formula, 5-Point Likert Scale, and Weighted Mean.

All of the study's conclusions, findings, and recommendations are based only on the responses of the respondents, secondary sources, and data gathered from both municipalities, specifically the City of Alaminos and Municipality of Bolinao, as well as the researchers' manual interpretation.

This statement reaffirms the research process's human-centeredness and honesty.

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