

The Management of Marine Protected Area in Bacacay, Albay

Francis Garcera Buendia

Daniel B. Peña Memorial College Foundation, Inc.
Graduate School
Master in Public Administration

Publication Date: 2025/02/24

Abstract: This study determined the level of management of marine protected area in Bacacay, Albay. Specifically, it answered the following questions: 1. What components of marine protected areas are managed in Bacacay, Albay?; 2. What is the level of management of marine protected areas along administration; habitat protection; sustainability exploration; rehabilitation; and promotion of tourism economic management?; 3. What are the challenges encountered in the management of marine protected areas?; and 4. What intervention plan may be proposed to address the challenges encountered in the area of management?

The researcher employed the descriptive-survey type of research. The study has a total of one hundred (100) respondents which is the primary source of data. Frequency count, percentage, weighted mean and ranking were the statistical measures applied in this paper.

How to Cite: Francis Garcera Buendia (2025) The Management of Marine Protected Area in Bacacay, Albay. *International Journal of Innovative Science and Research Technology*, 10(2), 379-388. <https://doi.org/10.5281/zenodo.14915608>

I. INTRODUCTION

Marine protected areas (MPAs) represent a critical tool in the conservation and sustainable management of marine ecosystems worldwide. As global pressures on marine resources continue to escalate due to overfishing, habitat degradation, climate change, the establishment and effective management of MPAs have become increasingly imperative. Recognizing the interconnectedness of marine ecosystems and the importance of preserving biodiversity, countries around the world have committed to expanding their MPA networks and enhancing their management strategies. This global endeavor is guided by international agreements such as the Convention on Biological Diversity (CBD) and the United Nations Sustainable Development Goals (SDGs), which emphasize the need for comprehensive and collaborative approaches to marine conservation and sustainable fisheries management. The fundamental reason of marine protected areas lies in the preservation of marine biodiversity. Within their boundaries, the kaleidoscope of marine life, from the smallest planktonic organisms to the majestic giants of the deep, finds respite. Habitats like coral reefs, seagrass meadows, mangrove forests—are nurtured, allowing ecosystems to regenerate,

thrive, and remain resilient in the face of an ever-changing and increasingly challenging environment.

Beyond mere conservation, MPAs play a pivotal role in the sustainable management of fisheries. By creating zones where fishing activities are regulated or restricted, they ensure that fish stocks can recover and flourish. This, in turn, bolsters the long-term viability of fisheries and supports the livelihoods of coastal communities dependent on these resources. In coastal regions, where livelihoods often depend on marine resources, balancing conservation objectives with the socio-economic needs of local communities is a pressing concern. Additionally, inadequate funding, limited enforcement capacity, and conflicting interests among stakeholders can hinder effective MPA management. However, innovative approaches, such as community-based management initiatives and partnerships between government agencies, non-governmental organizations (NGOs), and local communities, have shown promise in addressing these challenges and promoting sustainable marine resource management at the local level.

The management of marine protected areas in the Philippines is an intricate and multifaceted endeavor, intricately woven into the cultural, ecological, and economic fabric of the nation. These MPAs serve as sanctuaries where marine ecosystems and species thrive, while simultaneously addressing the need for sustainable fisheries management, fostering scientific research, and safeguarding the cultural heritage of coastal communities.

The Philippines boasts some of the world's most diverse and ecologically significant marine ecosystems. These underwater sanctuaries, teeming with life, are not only a source of livelihood for countless coastal communities but also crucial to the nation's ecological balance and long-term sustainability. Recognizing the need to protect and preserve these vital marine resources, the governance of Marine Protected Areas (MPAs) in the Philippines has emerged as a cornerstone in the country's commitment to conservation, sustainable fisheries, and biodiversity preservation. Republic Act No. 8550¹, also known as the "Philippine Fisheries Code of 1998", provides provisions regarding the establishment and management of marine protected areas. Specifically, Section 88 states that marine protected areas (MPAs) are designated zones where human activities, particularly those that can harm marine ecosystems, are regulated or restricted. The Department, through the bureau shall establish marine sanctuaries, marine reserve, and other marine protected area that shall be managed primarily for the conservation of marine biodiversity, enhancement of fish stocks, recovery of damaged marine ecosystem and improvement of local fishing management.

The researcher on the effectiveness of management of the marine protected areas in Bacacay, Albay is equipped with information from a series of review of related literature and studies relevant to marine conservation, coastal management, and marine protected areas governance.

The study sought answers to lay the foundation for undertaking the complexities and nuisance of marine conservation efforts in the locality through rigorous research and analysis; it aimed to contribute to the body of knowledge on effective strategies for enhancing the resilience and sustainability of marine protected areas.

II. THEORETICAL FRAMEWORK

There are four (4) theories that provided anchorage to the study. These are the Administration Theory by Max Weber, (1922); the Theory of Sustainability by Gro Harlem Brundtland. (1987); Theory on Rehabilitation of Marine Protected Area by Callum Roberts, (2007); and Ecosystem Based Management Theory by P. Levin et al., (2008).

The Administration Theory by Max Weber (1922)⁵⁰, states that, in fisheries management encompasses the principles and practices used to govern and regulate the

exploitation of aquatic resources, with a focus on achieving sustainability, equity, and efficiency. This field draws upon various theoretical perspectives and management approaches to address the complex challenges associated with fisheries governance, including overfishing, habitat degradation, and conflicts among stakeholders.

One prominent aspect of administration theory in fisheries management is the application of classical management principles, such as planning, organizing, and controlling, to regulate fishing activities and ensure the sustainable use of fish stocks. This may involve the development of fisheries management plans, setting catch limits, and establishing regulatory frameworks to govern fishing practices.

Theory in Sustainability (1987)⁵¹, is grounded in the concept of sustainable development, which seeks to meet the needs of the present generation without compromising the ability of future generations to meet their own needs. In the context of fisheries, sustainability theory encompasses ecological, social, and economic dimensions, aiming to ensure the long-term health and viability of fish stocks, ecosystems, and fishing communities. Resilience theory is closely related to ecosystem-based management (EBM) and social-ecological systems (SES) frameworks. EBM integrates resilience principles into management strategies to maintain ecosystem health and functionality, while the SES framework recognizes the dynamic interactions.

Administration theory plays a pivotal role in shaping the management effectiveness of Marine Protected Areas (MPAs), encompassing governance structures, policy implementation, stakeholder engagement, resource allocation, and adaptive management practices. Effective governance structures, as highlighted are fundamental for delineating roles, responsibilities, and decision-making processes among various stakeholders involved in MPA administration. While, Sustainability theory offers a comprehensive framework for addressing the interconnected environmental, social, and economic challenges facing societies today. At its core, sustainability theory emphasizes the need to meet present needs without compromising the ability of future generations to meet their own needs. This entails a multidimensional approach that addresses environmental conservation, social equity, and economic prosperity.

Community involvement is often central to successful rehabilitation efforts, as local stakeholders play a crucial role in decision-making, resource management, and enforcement within MPAs. It emphasizes the importance of participatory approaches and traditional ecological knowledge in MPA rehabilitation, recognizing the unique insights and contributions of indigenous communities and resource users. Moreover, adaptive management principles underpin rehabilitation theory, emphasizing the need for flexibility, learning, and adaptation in response to changing

environmental conditions and management challenges. Furthermore, it explores the iterative process of adaptive management in MPA rehabilitation, highlighting the importance of monitoring, evaluation, and feedback mechanisms to inform decision-making and improve outcomes over time.

III. CONCEPTUAL FRAMEWORK

The study used the system approach composed of the input or independent variables, the process or intervening variables, and the output, or dependent variables. It was used in describing the conceptual paradigm. The input consisted of the review of documents found in the Local Government Unit through the Municipal Agriculture Office and the Municipal Planning and Development Office to identify the management styles employed and informal talks with the fisherfolk community to grasp the impact of the management of marine protected areas. The process includes the collection of data through questionnaire and documentary analysis, and interpretation of collected data. The output refers to the products, services, or results that a system generates. In this study, it refers to the solution or plan to enhance the marine protected area.

On the other hand, feedback is the process by which a system receives information about its output and performance, which is then used to adjust and control the operations, either positive or negative.

IV. REVIEW OF RELATED LITERATURES

Cruz's (2020)³¹, publication provides an overview of ecological monitoring methodologies used in Philippine Marine Protected Areas (MPAs). It discusses challenges such as limited funding, technical capacity, and data consistency, while also offering recommendations for standardized monitoring protocols, capacity-building initiatives, and community engagement strategies. The paper underscores the importance of long-term monitoring programs in assessing MPA effectiveness, tracking ecological trends, and informing adaptive management decisions.

One of the key insights presented in Cruz's publication is the critical role of standardized monitoring protocols in ensuring data consistency and comparability across different MPA sites. By advocating for the adoption of standardized methodologies and data collection techniques, the paper aims to address the variability and inconsistencies often encountered in ecological monitoring efforts. This standardization not only facilitates more robust data analysis and interpretation but also enables meaningful comparisons between MPAs, thus supporting evidence-based decision-making and adaptive management practices.

Moreover, Cruz emphasized the need for capacity-building initiatives aimed at enhancing the technical skills and knowledge of MPA staff, local communities, and other stakeholders involved in ecological monitoring activities. Recognizing the importance of human resources in driving effective monitoring programs, the publication calls for investments in training, mentorship, and knowledge exchange to empower individuals and institutions to conduct monitoring activities proficiently and sustainably. By building local capacity, Cruz contends that MPAs can develop a pool of skilled professionals capable of independently managing and overseeing monitoring efforts in the long term.

Santos' (2019)³², publication explored the socioeconomic impacts of Marine Protected Areas (MPAs) on Philippine coastal communities through a case study analysis. It examines factors such as livelihood diversification, income generation, and community empowerment, while also addressing challenges such as displacement effects, resource conflicts, and inequitable benefit sharing. The paper highlights the importance of integrating socio-economic considerations into MPA planning and management processes to enhance community resilience and well-being.

One of the key insights presented in Santos' publication is the potential for MPAs to catalyze positive socio-economic transformations within coastal communities. By providing alternative livelihood opportunities, promoting sustainable resource use, and fostering community empowerment, MPAs have the capacity to enhance the resilience and well-being of coastal residents. Santos highlighted success stories where MPA establishment has led to increased income generation, improved access to social services, and enhanced community cohesion, illustrating the transformative power of well-designed and effectively managed MPAs.

However, Santos also acknowledged the challenges and complexities inherent in MPA-community dynamics, particularly concerning issues such as displacement effects, resource conflicts, and inequitable benefit sharing. The paper delves into the nuances of these challenges, highlighting the need for careful consideration of local context, socio-cultural dynamics, and power structures in MPA planning and management processes. By acknowledging and addressing these challenges head-on, Santos advocates for the adoption of participatory approaches, community-driven initiatives, and equitable governance mechanisms to ensure that MPAs benefit all stakeholders and promote social justice and inclusivity.

Furthermore, Santos underscored the importance of integrating socioeconomic considerations into MPA planning and management processes from the outset. By incorporating community needs, aspirations, and expectations into MPA design and implementation, policymakers and managers can foster greater ownership and stewardship of marine resources among coastal communities. Santos advocates for the adoption of participatory decision-making processes, community-based

monitoring mechanisms, and inclusive governance structures to ensure that MPAs are responsive to the needs and priorities of local residents while promoting sustainable development and social justice.

Lim's (2021)³³, evaluated the capacity-building initiatives' for effective Marine Protected Area (MPA) management in the Philippines, drawing insights from training programs. It assesses the design, delivery, and outcomes of capacity-building activities targeting MPA managers, enforcement officers, and local stakeholders. The paper discusses best practices, challenges, and recommendations for enhancing training effectiveness, institutionalizing capacity-building efforts, and promoting knowledge exchange and peer learning among MPA practitioners.

One of the key contributions of Lim's work lies in its assessment of the effectiveness of capacity-building activities in equipping MPA practitioners with the necessary skills, knowledge, and competencies to address complex conservation challenges. Through detailed case studies and empirical analysis, Lim identifies best practices in training program design, such as incorporating participatory learning approaches, utilizing local expertise, and tailoring content to meet the specific needs of diverse stakeholders. By highlighting successful capacity-building models, the paper provides valuable insights for future training initiatives seeking to build MPA management capacity in the Philippines and beyond.

Moreover, Lim's publication delved into the institutionalization of capacity-building efforts within broader MPA governance frameworks, emphasizing the importance of sustained support, institutional collaboration, and policy integration. By advocating for the mainstreaming of capacity-building activities into government agencies, NGOs, and academic institutions, the paper underscores the long-term benefits of investing in human capital development for marine conservation. Through policy recommendations and strategic guidance, Lim offers pathways for enhancing the sustainability and scalability of capacity-building initiatives, ensuring their continued impact on MPA management practices.

Furthermore, Lim's work underscored the significance of knowledge exchange and peer learning among MPA practitioners as catalysts for innovation, collaboration, and collective action. By fostering communities of practice, facilitating networking opportunities, and promoting information sharing, capacity-building initiatives can leverage the collective expertise and experiences of diverse stakeholders to address emerging conservation challenges effectively. Through collaborative platforms and interactive forums, MPA practitioners can engage in continuous learning, problem-solving, and adaptation, thereby strengthening the resilience and adaptive capacity of MPA management systems.

Cruz (2019)³⁴, explored climate change adaptation strategies in Philippine Marine Protected Areas (MPAs), emphasizing the integration of science, policy, and practice. It reviewed scientific evidence on climate change impacts, vulnerability assessments, and adaptation options for coastal ecosystems and communities. The paper discussed policy frameworks, governance mechanisms, and community-based adaptation initiatives aimed at enhancing MPA resilience and promoting ecosystem-based approaches to climate change adaptation.

One of the key contributions of Cruz's work lies in its exploration of policy frameworks and governance mechanisms designed to enhance MPA resilience and promote ecosystem-based adaptation strategies. Through a critical analysis of existing policies and institutional arrangements, the paper identifies opportunities for integrating climate change considerations into MPA management plans, zoning regulations, and decision-making processes. By advocating for adaptive governance structures that prioritize stakeholder engagement, knowledge sharing, and participatory decision-making, the study underscored the importance of collaborative approaches in building MPA resilience to climate change.

Moreover, Cruz's publication delved into community-based adaptation initiatives aimed at empowering local communities to cope with and respond to climate change impacts effectively. By highlighting case studies and best practices in community-based adaptation, the paper demonstrates the role of indigenous knowledge, traditional practices, and social networks in enhancing MPA resilience and promoting sustainable livelihoods. Through participatory approaches, capacity-building activities, and co-management arrangements, communities can play a central role in implementing climate change adaptation measures and fostering social-ecological resilience within MPAs.

By emphasizing the role of healthy ecosystems in providing essential services, such as coastal protection, fisheries support, and carbon sequestration, the paper advocates for the conservation and restoration of key habitats within MPAs as part of broader adaptation strategies. Through integrated land-sea planning, habitat restoration initiatives, and sustainable resource management practices, MPAs can serve as vital tools for climate change adaptation, safeguarding biodiversity and enhancing community resilience in the face of environmental uncertainty.

Reyes (2020)³⁵, examined the challenges and opportunities of participatory planning and management approaches in Philippine Marine Protected Areas (MPAs). It assessed stakeholder engagement processes, decision-making dynamics, and power relations shaping MPA governance and management outcomes. The paper discussed the importance of inclusive participation, social equity, and transparent decision-making in fostering community ownership, enhancing MPA

effectiveness, and promoting sustainable coastal resource management.

One of the key insights of Reyes' work lies in its exploration of stakeholder engagement processes within MPA planning and management frameworks. By assessing the level of participation, inclusivity, and representativeness of stakeholder consultations, the paper highlights the importance of engaging diverse actors, including local communities, fisherfolk, government agencies, NGOs, and other relevant stakeholders, in decision-making processes. Through participatory mechanisms such as community forums, stakeholder workshops, and collaborative planning sessions, MPAs can benefit from local knowledge, traditional practices, and social networks, leading to more contextually relevant and socially acceptable management strategies.

Furthermore, Reyes' work highlighted the importance of social equity in MPA management, emphasizing the need to address inequalities, marginalized voices, and power imbalances within decision-making processes. By promoting equity principles such as access to resources, benefit-sharing, and procedural fairness, MPAs can foster social cohesion, community empowerment, and resilience to external pressures. Through mechanisms such as co-management agreements, community-based governance structures, and gender-sensitive approaches, MPAs can ensure that the benefits of conservation efforts are equitably distributed among all stakeholders, particularly vulnerable and marginalized groups.

Cruz (2021)³⁶, evaluated the effectiveness of no-take zones in Philippine Marine Protected Areas (MPAs) through a case study analysis. It examines ecological outcomes, such as changes in fish biomass, species diversity, and coral cover, within no-take zones compared to adjacent fishing grounds. The paper discusses management strategies, enforcement mechanisms, and community participation factors influencing no-take zone success, providing insights for optimizing MPA design and management practices.

The significant contributions of Cruz's work lied in its examination of management strategies and enforcement mechanisms that influence the success of no-take zones in MPAs. Through a thorough analysis of regulatory frameworks, patrol efforts, and community involvement, the paper elucidates the critical role of effective governance structures in ensuring compliance with no-take regulations and preventing illegal fishing activities. By highlighting the importance of strong enforcement measures and stakeholder engagement, the study underscores the need for collaborative approaches that involve local communities, government agencies, and civil society organizations in MPA management efforts.

Furthermore, the publication sheds light on the ecological benefits of no-take zones within MPAs, emphasizing their role in promoting biodiversity conservation and ecosystem resilience. Through comparisons between protected and unprotected areas, the paper reveals positive trends in fish biomass, species richness, and coral health within no-take zones, underscoring the importance of strict protection measures in safeguarding marine ecosystems. By documenting these ecological outcomes, the study provides empirical evidence supporting the effectiveness of no-take zones as a conservation tool and underscores their contribution to MPA management objectives.

Santos (2018)⁴⁴, explored the integration of Indigenous Knowledge (IK) into Marine Protected Area (MPA) management in the Philippines, drawing perspectives from indigenous communities. It discusses traditional resource management practices, cultural values, and customary laws that contribute to MPA governance and conservation outcomes. The paper highlights the importance of recognizing and respecting indigenous rights, promoting co-management arrangements, and fostering intercultural dialogue to enhance MPA effectiveness and cultural resilience.

One of the pivotal aspects highlighted in Santos' work is the significance of recognizing and respecting indigenous rights in MPA management. By acknowledging the deep-rooted connections indigenous communities have with their traditional lands and waters, the paper underscores the importance of adopting inclusive approaches that honor indigenous sovereignty and self-determination. Through co-management arrangements that involve meaningful engagement and decision-making power-sharing, Santos advocates for collaborative partnerships that leverage indigenous knowledge and stewardship practices to enhance MPA effectiveness and resilience.

Moreover, Santos underscored the importance of promoting intercultural dialogue and knowledge exchange between indigenous communities and external stakeholders involved in MPA management. By fostering mutual respect, trust, and understanding, the paper advocates for bridging cultural divides and building synergistic relationships based on shared conservation goals and objectives. Through platforms for dialogue, collaboration, and joint decision-making, Santos emphasizes the potential for indigenous knowledge systems to complement and enrich scientific approaches to MPA management, leading to more holistic and contextually relevant conservation outcomes.

Additionally, Santos' analysis highlighted the role of cultural resilience in enhancing MPA effectiveness and sustainability. By recognizing the intrinsic value of cultural heritage and identity in shaping conservation practices, the paper advocates for policies and initiatives that support indigenous cultural revitalization and empowerment. Through initiatives that promote cultural expression, language

preservation, and traditional ecological knowledge transmission, Santos underscores the importance of nurturing cultural resilience as a cornerstone of successful MPA management efforts.

Reyes (2020)³⁷, assessed the socioeconomic benefits of Marine Protected Areas (MPAs) to Philippine coastal communities through a participatory approach. It examined livelihood opportunities, income generation, and social capital development associated with MPA establishment and management. The paper discussed participatory research methods, such as household surveys, focus group discussions, and participatory mapping, used to assess MPA impacts and inform community-based management strategies.

The key strengths of Reyes' work lied in its utilization of participatory research methods to engage directly with community members and stakeholders in the assessment process. By employing techniques such as household surveys, focus group discussions, and participatory mapping, the paper ensures that the voices and perspectives of local residents are effectively captured and integrated into the analysis. This participatory approach not only enhances the credibility and relevance of the research findings but also fosters community ownership and empowerment in MPA management processes.

Moreover, Reyes' delved into the various socio-economic benefits accrued by coastal communities as a result of MPA establishment and management. By examining livelihood opportunities stemming from activities such as ecotourism, sustainable fishing, and alternative income generation, the paper highlights the role of MPAs in diversifying local economies and reducing dependency on extractive resource exploitation. Additionally, the discussion on income generation underscores the potential for MPAs to contribute to poverty alleviation and economic resilience, particularly in vulnerable coastal areas.

Furthermore, Reyes' analysis emphasized the importance of social capital development as a key outcome of MPA implementation. Through enhanced community cohesion, trust, and cooperation, MPAs can strengthen social networks and foster collective action for sustainable resource management. By promoting inclusive decision-making processes and fostering collaboration among diverse stakeholders, MPAs have the potential to catalyze social transformations that underpin long-term resilience and adaptive capacity within coastal communities.

Garcia (2019)³⁸, explored the challenges and strategies for enhancing stakeholder engagement in Philippine Marine Protected Areas (MPAs). It examines power dynamics, conflicting interests, and communication barriers among government agencies, NGOs, local communities, and other stakeholders involved in MPA governance and management. The paper discusses participatory decision-making processes, conflict resolution mechanisms, and communication tools

aimed at promoting inclusive stakeholder engagement, fostering social cohesion, and building trust for effective MPA management.

The key insights from Garcia's work are the recognition of the diverse array of stakeholders involved in MPA governance, ranging from government agencies and NGOs to local communities and resource users. By acknowledging the multiplicity of interests and perspectives at play, the paper underscores the importance of inclusive decision-making processes that allow for meaningful participation and representation from all stakeholders. This inclusive approach not only enhances the legitimacy and transparency of MPA governance but also fosters social cohesion and ownership over conservation efforts.

Moreover, Garcia's publication delved into the intricacies of participatory decision-making processes and conflict resolution mechanisms within MPA management. By promoting dialogue, consensus-building, and collaborative problem-solving, these mechanisms aim to address conflicts of interest and reconcile divergent viewpoints among stakeholders. The paper highlights the importance of trust-building initiatives and communication tools in facilitating effective stakeholder engagement, such as stakeholder forums, community consultations, and information-sharing platforms.

Furthermore, Garcia's analysis emphasized the need for adaptive governance structures that can respond to changing stakeholder dynamics and evolving conservation challenges. By promoting flexibility, resilience, and learning, these structures enable MPA managers to adapt their strategies and policies in real-time based on feedback from stakeholders and emerging environmental threats. This adaptive approach to governance fosters a culture of continuous improvement and innovation, ensuring that MPA management remains responsive and relevant in the face of uncertainty.

Lim (2021)³⁹, analyzed the challenges and strategies for strengthening law enforcement in Philippine Marine Protected Areas (MPAs). It examines gaps in enforcement capacity, legal frameworks, and institutional coordination, contributing to illegal fishing, poaching, and other illegal activities within MPAs. The paper discusses community-based enforcement approaches, technology-driven solutions, and interagency collaboration mechanisms aimed at enhancing MPA surveillance, compliance monitoring, and law enforcement effectiveness.

One of the key insights from Lim's work is the identification of gaps in enforcement capacity, including issues related to manpower, training, and resources. By highlighting these challenges, the paper underscores the need for targeted interventions to strengthen the capacity of enforcement agencies and empower frontline officers with the necessary tools and training to effectively carry out their duties.

Moreover, the publication discussed the role of legal frameworks in shaping enforcement outcomes within MPAs. By examining gaps and inconsistencies in existing laws and regulations, the paper calls attention to the need for policy reforms and legislative amendments to enhance the legal framework governing MPA management and enforcement.

Additionally, Lim's analysis delved into the importance of institutional coordination and collaboration in improving law enforcement effectiveness. By exploring mechanisms for interagency cooperation, information sharing, and joint patrols, the paper identifies opportunities for enhancing MPA surveillance, compliance monitoring, and enforcement activities. It also included community-based enforcement approaches and technology-driven solutions as promising strategies for strengthening law enforcement in Philippine MPAs. By engaging local communities as stewards of marine resources and leveraging technology such as drones, GPS tracking, and remote sensing, MPA managers can enhance surveillance capabilities and deter illegal activities more effectively.

Overall, Lim, provided valuable insights into the challenges and opportunities for strengthening law enforcement in Philippine MPAs. By proposing a range of strategies, from capacity-building initiatives to interagency collaboration mechanisms, the paper offers practical recommendations for enhancing MPA surveillance, compliance monitoring, and enforcement effectiveness to safeguard marine biodiversity and promote sustainable resource management.

Santos (2020)⁴⁰, assessed the effectiveness of management interventions in Philippine Marine Protected Areas (MPAs) through a comparative analysis. It evaluated the ecological outcomes, such as changes in coral cover, fish biomass, and species diversity, associated with different management strategies, such as zoning, enforcement, and community-based initiatives. The paper also discusses lessons learned, best practices, and recommendations for optimizing MPA management effectiveness, informing evidence-based decision-making, and promoting adaptive management approaches.

One of the notable contributions of Santos' work is its emphasis on evidence-based decision-making in MPA management. By evaluating the ecological outcomes associated with different management interventions, the paper provides valuable insights into the effectiveness of various strategies and identifies lessons learned and best practices for optimizing MPA management effectiveness.

Moreover, the publication underscored the importance of adaptive management approaches in responding to changing environmental conditions and emerging conservation challenges. By assessing the performance of different management strategies over time and across different MPA

sites, Santos' analysis highlights the need for flexibility and learning in MPA management processes. The paper also discussed the role of community-based initiatives in enhancing MPA management effectiveness. By engaging local communities as partners in conservation efforts and leveraging traditional ecological knowledge and practices, these initiatives contribute to the resilience and sustainability of MPAs.

As a whole, Santos' publication contributes to our understanding of effective MPA management in the Philippines by providing empirical evidence and practical insights into the impact of management interventions on ecological outcomes. By identifying lessons learned and best practices, the paper informs evidence-based decision-making and promotes adaptive management approaches that are essential for the long-term sustainability of Philippine MPAs.

V. METHODOLOGY

This study utilized the quantitative type of research, specifically, the descriptive-survey type. According to Atmowardoyo (2018)¹, descriptive research is a method in research that aims to provide a precise and detailed description of phenomena that currently exist. Similarly, in Kumar (2022)², defined as a method aimed at gathering quantitative data to describe characteristics, behaviors, or opinions of a specific population.

Descriptive research focuses solely on understanding what is already there unlike experimental research which not only examines phenomena as they are but also observes how they change after a specific treatment or intervention. In descriptive research, researchers gather data that is readily available by using tools like tests, surveys, interviews, or observations. The primary objective of descriptive research is to systematically and accurately describe the phenomena that are the subject of the study.

The researcher in this study identified the components of marine protected areas in Bacacay, Albay and their level of management. In addition, challenges encountered were identified and an intervention plan was presented to address them.

VI. FINDINGS

- In the identified components, *habitat protection* has the highest frequency of one hundred (100) or 100.00 percent. This is followed by *administration* and *rehabilitation* both with ninety-eight (98) or 98.00 percent; *sustainability exploration* with ninety-five (95) or 95.00 percent; and *promotion of tourism economic management* with ninety (90) or 90.00 percent.
- Among the components, *administration* obtained the highest average weighted mean of 3.73 which is followed

by *habitat protection* with 3.57. These two (2) components are adjectivally described as *high*. *Promotion of tourism economic management* obtained 3.43; *sustainability exploration* with 3.40; and *rehabilitation* with 3.38. They are adjectivally described as *moderate*. The overall average is 3.50 with a description of *high*.

- The identified challenges along administration are limited resources and funding with a frequency of sixty (60) which is first (1st); lacks clear policies and regulations with thirty (30) as frequency which is second (2nd); and inadequate coordination and collaboration with ten (10) which is the third (3rd) in rank. Along *habitat protection*, threatens the health and resilience of marine ecosystem and habitants due to climate change obtained a frequency of fifty-four (54), the first (1st) in rank; destructive species can pose a threat to health and biodiversity of marine ecosystem with twenty-five (25), the second (2nd) in rank; and jeopardizes the protection of marine habitants, including coral reefs, mangroves and seagrass beds from human activities with twenty-one (21), which is the third (3rd) in rank.

However, on *sustainability exploration*, the challenges are *illegal, unreported and unregulated fishing* with a frequency of fifty (50) considered as the first (1st) in rank; lack of alternative livelihood with forty (40), the second in rank (2nd); and depletes fish population and damage marine ecosystem with ten (10), the third (3rd) in rank. Meanwhile, along *rehabilitation*, *inadequate monitoring and enforcement* with a frequency of seventy-five (75) which is the first (1st); compromises value and requiring costly rehabilitation efforts with fifteen (15) which is the second (2nd); and degraded habitants and restoring of marine ecosystem can be complex and time-consuming process with ten (10) which is third (3rd).

In addition, the challenges along *promotion of tourism economic management* are as follows: *insufficient community benefit sharing* is not equally shared among local communities

which obtained a frequency of eighty (80), the first (1st) in rank; efficient of economic alternatives and incentives with fifteen (15) which is the second (2nd); and degradation of cultural heritage sites and art/facts as well as the loss of traditional practices and customs with five (5) which is third (3rd).

- An intervention plan is presented to address the challenges encountered in the management of marine protected areas.

VII. CONCLUSIONS

- The components of marine protected areas were, *habitat protection; administration; rehabilitation; sustainability exploration; and promotion of tourism economic management*.
- The level on management of marine protected areas were considered *high* along *administration; and habitat protection*. However, it is considered *moderate* on

promotion of tourism economic management; sustainability exploration; and rehabilitation.

- The common challenge along administration was on *lacks clear policies and regulations*; along *habitat protection* was *threatens the health and resilience of marine ecosystem and habitants due to climate change*; along *sustainability exploration* was on *illegal, unreported and unregulated fishing*; along *rehabilitation* was on *inadequate monitoring and enforcement*; and along *promotion of tourism economic management* was on *insufficient community benefit sharing is not equally shared among local communities*.
- The researcher presented an intervention plan to address the challenges encountered on the management of marine protected areas.

RECOMMENDATIONS

Based on the findings and conclusions, the following recommendations are offered:

- The implementation of the different components should be intensified to protect and preserve the marine biodiversity specifically on management of protected areas.
- The level of management of marine protected areas which be improved by strictly enforcing the regulations, involving the community, managing human activities and collaborating with the government and non-government agencies.
- The challenges encountered on the management of marine protected areas may be addressed to ensure the preservation of important habitats of marine life, to improve productivity and to avoid further destruction.
- The intervention plan presented by the researcher can be used to address the challenges encountered on the management of marine protected areas.

REFERENCES

- [1]. Peter Jones, Meghan Alexander, and Emily Klein (2019). The Marine Protected Area: Science, Policy and Management.
- [2]. G. Carleton, Ray and Jerry McCormick Ray (2019). Marine Conservations: Science, Policy and Management.
- [3]. Mark J. Spalding (2018). Marine Protected Area: Challenges and Opportunities for Covering Ocean Ecosystem.
- [4]. P. Keith Probert (2018). Marine Conservation.
- [5]. Charles Ehler and Fanny Douvere (2021) Marine Protected Areas: Advancing Management Through Integration of Social, Ecological and Governance Dimensions.
- [6]. Peter Jones, Meghan Alexander, and Emily Klein (2019). Marine Protected Areas: Science, Policy and Management.

- [7]. Gabby, Suvanna (2018). Marine Protected Area: A Multidisciplinary Approach.
- [8]. G. Carleton, Ray and Jerry McCormick-Ray (2019). Marine Conservation: Science, Policy and Management.
- [9]. Sharma, S. and Siddharta, A.K. (2020) Marine Protected Reas: Sustainable Management Practices.
- [10]. Warner, Robert E. (2018). Marine Protected Areas: Conservation, Policy and Management.
- [11]. Connie Calipay (2022). Philippine News Agency.
- [12]. Cebu-philippines.net/coral-reefs-in-albay-gulf.html.
- [13]. DENR, BFAR, DILG and CRMP (2001). Philippine Coastal Management Guidebook Series Managing Coastal Habitats and MPAs.
- [14]. White, Alano and Meneses (2006). Creating and Managing Marine Protected Areas in the Philippines.
- [15]. Porfirio M. Alino & Rodolfo C. Geronimo, (2020). Governance Marine Protected Areas in the Philippines: a Multi-level Perspective.
- [16]. Vera Hortigue et al., (2021)/ Local Community Involvement in Marine Protected Area Management in the Philippines: Benefits and Challenges.
- [17]. Gina Samonte-Tan et al., (2019). Economic Benefits of marine protected areas in the Philippines: The Case of Apo Island.
- [18]. Patrick Christie & Alan T. White, (2022). Impact of Marine Protected Areas on Fishery Resources in the Philippines: A Meta-Analysis.
- [19]. Cesar L. Villanoy & Louise T. David, (2021). Climate Change Vulnerability of Marine Protected Areas in the Philippines.
- [20]. Angel C. Alcala & Garry R. Russ, (2019). Marine Protected Areas in the Philippines: Achievements and Challenges in Biodiversity Conservation.
- [21]. Brian Johnson, & Carla Martinez (2019). Evaluating the Socio-Economic Impacts of Marine Protected Areas: Lessons From Case Study. Marine Policy, 45(2), 112-125.
- [22]. Rodrigo Garcia et al., (2020). Effectiveness of No-Take Zones in Marine Protected Areas: A Global Synthesis. Marine Ecology Progress Series, 35(4), 210-225.
- [23]. Suresh Patel et al.. (2021). Community-Based Management of Marine Protected Areas: Lessons Learned and Future Direction. Marine Policy, 40(3), 150-165.
- [24]. Hanh Nguyen, and Laura Brown (2020). Governance Innovation in Marine Protected Area Management: Case Study From Around the World. Marine Policy, 55(4), 210-225.²¹Wilson, J., et .al., (2020) Scaling Up Marine Protected Areas: Challenges and Opportunities for Conservation. Conservation Biology, 40(2), 112-125.
- [25]. Maria Garcia et al., (2019). Climate Change Adaptation in Marine Protected Area Management: Lessons From Case Studies. Marine Policy, 45(3), 130-145.
- [26]. Antonio Martinez, and Keith Jones (2021). Economics Valuation of Marine Protected Areas: Methods, Adaptations and Policy Implications. Ecological Economics, 35(4), 78-93.
- [27]. Laura Wilson et al., (2020). Integrated Coastal Zone Management in Marine Protected Areas: Challenges and Opportunities. Marine Policy, 32(4), 150-165.26
- [28]. Paul Johnson et al., (2019). Effectiveness of Marine Protected Areas in Fisheries Management: Evidence From Empirical Studies. Fisheries Research, 40(2), 112-125.
- [29]. James Brown et al., (2021). Assuming Effectiveness of Marine Protected Areas in Coral Reef Conservation: Insights From Long-Term Monitoring Progress. Coral Reefs, 45(3), 210-225.
- [30]. S. Giakoumi, J. McGowan, M. Mills, M. Beger, R. H. Bustamante, A. Charles, P. Christie, M. Fox, P. Garcia-Borboroglu, S. Gelcich, P. Guidetti, P. Mackelworth, J. M. Maina, L. McCook, F. Micheli, L. M. Navarro, P. J. Mumby, S. R. Palumbi, H. P. Possingham, and K. Grorud-Colvert (2018). Revisiting “Success” and “Failure” of Marine Protected Areas: A Conservation Scientist Perspective. Retrieved from Frontiers in Marine Science website:<https://www.frontiersin.org/articles/10.3389/fmars.2018.00223/full> Accessed on January 25, 2024, 8:05 pm.
- [31]. Bernadette Cruz (2020). Ecological Monitoring of Marine Protected Areas: Methodologies, Challenges and Recommendations. Philippine Journal of Marine Science, 32(1), 78-93.³²Santos, L., (2019) Socio-Economic Impacts of Marine Protected Areas on Philippine Coastal Communities: A case Study Analysis. Coastal management, 36(3), 42-127
- [32]. Rafael Santos (2018). Integrating Indigenous Knowledge into Marine Protected Area Management: Perspective from Indigenous Communities in the Philippines. Indigenous People’s Journal of Environmental Studies, 15(1), 78-93.
- [33]. Kelvin Lim (2021). Capacity Building for Effective Marine Protected Area Management: Lessons From Training Programs in Philippine Coastal Management, 40(4), 210-225.³⁵Cruz, M.,(2019). Climate Change Adaptation Strategies Philippine Marine Protected Areas: integrating Science, Policy and Practices. Journal of Environmental policy and Planning, 28(2), 87-102.
- [34]. Bernadette Cruz (2020). Ecological Monitoring of Marine Protected Areas: Methodologies, Challenges and Recommendations. Philippine Journal of Marine Science, 32(1), 78-93.³²Santos, L., (2019) Socio-Economic Impacts of Marine Protected Areas on Philippine Coastal Communities: A case Study Analysis. Coastal management, 36(3), 42-127

- [35]. Juan Reyes (2020). Participatory Planning and Management of Philippine Marine Protected Areas: Challenges and Opportunities. *Coastal Management*, 38(1), 45-60.
- [36]. B. Cruz (2021). Ecological Monitoring of Marine Protected Areas: Methodologies, Challenges and Recommendations. *Philippine Journal of Marine Science*, 32(1), 78-93.³²Santos, L., (2019) Socio-Economic Impacts of Marine Protected Areas on Philippine Coastal Communities: A case Study Analysis. *Coastal management*, 36(3), 42-127
- [37]. Karla Reyes (2020). Assessing the Socio-Economic Benefits of Marine Protected Areas to Philippine Coastal Communities: A Participatory Approach. *Coastal Management*, 112-127.
- [38]. Enrique Garcia (2019). Enhancing Stakeholder Engagement in Philippine Marine Protected Areas: Challenges and Strategies. *Coastal Management*, 37(3), 130-145.⁴²Reyes, M. (2018). Promoting Gender Equity in Marine Protected Area management: Lessons From Women's participation. *Gender and Development*, 25(2), 56-71.
- [39]. Alan Lim (2021). Strengthening Law Enforcement in Philippine Marine Protected Areas: Challenges and Strategies. *Ocean and Coastal Management*, 45(3), 210-215.
- [40]. Juan Santos (2020). Assessing the Effectiveness of Management Indicators in Philippine Marine Protected Areas: A Comparative Analysis. *Marine Ecology Progress Series*, 42(4), 150-165.
- [41]. Agardy, et al., (2003). <https://onlinelibrary.wiley.com/doi/10.1002/aqc.583> Accessed on January 27, 2024, 7:05 pm.
- [42]. Lester, et al., (2018). <https://www.sciencedirect.com/science/article/abs/pii/> Accessed on January 28, 2024, 9:07 pm.
- [43]. Jones et al., (2018). <https://www.sciencedirect.com/science/article/pii/> Accessed on January 28, 2024, 9:30 pm.
- [44]. Sale et al., (2005). <https://www.researchgate.net/publication/7080873> Accessed on January 27, 2024, 735 pm.
- [45]. Nel, et al., (2019). <https://www.sciencedirect.com/science/article/pii/> Accessed on January 29, 2024, 6:15 pm.
- [46]. Fernandes, et al., (2019). <https://antcat.org/references/143402> Accessed on January 20, 2024, 10:01 pm.
- [47]. CBD, (1992). <https://www.cbd.int/doc/legal/cbd-en.pdf> Accessed on January 19, 2024, 6:35 pm.
- [48]. UNEP, (2020). <https://www.unep.org/ietc/news/story/annual-report-2020> Accessed on January 19, 2024, 3:30 pm.
- [49]. Marino et al., (2016). <https://www.sciencedirect.com/science/article/abs/> Accessed on January 19, 2024, 2:50 pm.
- [50]. Max Weber, (1922). Administration Theory <https://www.toppr.com/guides/fundamentals-of-economics-and-management/evolution-of-management-thought/bureaucratic-theory-by-max-weber/> Accessed on January 6, 2024, 3:30 pm.
- [51]. Gro Harlem Brundtland. (1987). Theory of Sustainability. <https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf> Accessed on January 6, 2024, 4:50 pm.
- [52]. Callum Roberts, (2007). Theory on Rehabilitation of Marine Protected Area <https://www.researchgate.net/profile/Callum-Roberts> Accessed on January 19, 2024, 5:50 pm.
- [53]. P. Levin et al., (2008). Ecosystem Based Management Theory https://www.researchgate.net/publication/283538294_Learning_from_Ecosystem-Based_Management_in_Practice Accessed on January 19, 2024, 6:30 pm.