

A MIXED-METHOD INQUIRY ON COMMUNITY KNOWLEDGE, ATTITUDINAL ORIENTATIONS, AND PRACTICES TOWARD PROTECTED AREA POLICIES IN THE CHOCOLATE HILLS, BOHOL, PHILIPPINES

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ABSTRACT

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Protected areas are vital for protecting biodiversity, but their long-term effectiveness often depends on the support and engagement of residents. The research was conducted to determine the knowledge, attitudes, and practices (KAP) of the inhabitants regarding the rules of the Chocolate Hills Natural Monument in the Philippines. Specifically, it measured respondents' levels of knowledge, attitudes, and conservation practices

and studied the relationships among the three dimensions. The study used a quantitative cross-sectional approach with a sample of 500 adult residents of six communities surrounding the protected area. A modified Knowledge–



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Attitudes–Practices questionnaire was completed by the chosen respondents using stratified random sampling. Descriptive statistics and Spearman's rank-order correlation were employed for data analysis. The results showed that the respondents had an intermediate level of understanding, a good attitude, and moderate conservation activities towards protected area policies, and experience and background in the community may be associated with beliefs and behaviors about conservation. Significant positive associations were also observed among knowledge, attitudes, and conservation practices, indicating that greater policy understanding typically correlates with positive attitudes and conservation practices. These results indicate that increasing environmental education, improving policy communication, and encouraging inclusive community engagement could further bolster conservation efforts within the Chocolate Hills Natural Monument. The study provides empirical evidence to help protected area managers and local government units formulate community-responsive policies that enhance biodiversity conservation and sustainable local development.

INTRODUCTION

Protected areas are widely recognized as necessary for the conservation of biodiversity, the maintenance of ecosystem services, and the preservation of landscapes of ecological, cultural, and economic importance. While legal designation is an important basis for conservation, experience from many nations shows that long-term preservation depends not just on policies and laws but also on the knowledge and engagement of the populations living in and around protected areas. Conservation activities are often more sustainable when citizens understand the importance of the environment and have a real opportunity to engage in conservation efforts (Berkes, 2009; McGinlay et al., 2023).

Over the last few years, we have seen a transition from seeing conservation largely as a regulatory problem to one of shared governance. It is the understanding that environmental policies are most likely to work when there are informed communities, transparent institutions, and collaborative decision-making. At the same time, conservation strategies typically overlap with subsistence demands, land use, tourism development, and local governance, creating circumstances in which ecological protection and socioeconomic realities must be carefully balanced (Pretty, 2003; Solomon et al., 2015).

Community knowledge, attitudes, and practices (KAP) have frequently been examined as indicators of public engagement in environmental management. The KAP framework suggests that knowledge may shape attitudes, while favorable attitudes may encourage environmentally responsible practices. However, previous studies also indicate that knowledge alone does not always lead to behavioral change because environmental actions are influenced by institutional, social, and economic conditions (Kollmuss & Agyeman, 2002;

Launiala, 2009). Consequently, understanding these dimensions together may provide a more comprehensive picture of how communities respond to conservation policies.

The Expanded National Integrated Protected Areas System (E-NIPAS) Act of 2018 in the Philippines requires improved preservation and management of biologically significant landscapes and more stakeholder engagement in the governance of protected areas. A robust legislative framework underpins the strategy, but the success of its targets will depend on local communities' awareness and support for conservation. Environmental education, community involvement, and perceived socioeconomic benefits have been suggested to influence public support for conservation programs in the Philippines (Agtong et al., 2022; Butiong & Butalid, 2021).

The Chocolate Hills Natural Monument (CHNM) in Bohol provides a suitable venue to investigate these concerns. The monument is one of the most distinctive geological features in the country, part of the Bohol Island UNESCO Global Geopark, and an internationally recognized conservation zone that offers tourism and local livelihood opportunities. Conservation policies must take into account these many roles, protecting the landscape while responding to the needs and ambitions of the people who surround it.

Despite growing interest in community-based conservation, relatively little empirical evidence exists on how communities surrounding the Chocolate Hills understand protected area policies, perceive conservation initiatives, and reflect these perspectives in their conservation practices. Existing studies have largely focused on environmental awareness, ecotourism, or community participation in other protected areas. At the same time, fewer have quantitatively examined the combined relationships among knowledge, attitudes, and practices within the context of the Chocolate Hills Natural Monument. Likewise, there remains limited evidence on whether selected demographic characteristics are associated with variations in community knowledge, attitudes, and conservation practices.

Addressing these gaps may contribute to both environmental policy and protected area management. Understanding how local communities perceive and respond to conservation policies may help protected area managers, local government units, and other stakeholders design environmental education programs, communication strategies, and participatory initiatives that are responsive to community needs while strengthening biodiversity conservation.

Accordingly, this study examined the knowledge, attitudes, and conservation practices of communities surrounding the Chocolate Hills Natural Monument toward protected area policies. Specifically, it described the respondents' levels of knowledge, attitudes, and conservation practices; examined the relationships among these dimensions; and described the respondents' levels of knowledge and attitudes. The findings are expected to provide empirical evidence that may assist policymakers and protected area managers in strengthening community participation and promoting more

effective conservation governance in one of the Philippines' most important protected landscapes.

Theoretical Background. The paradigm is particularly relevant in the context of protected areas because community behavior is influenced not only by environmental knowledge but also by access to information, perceived fairness, livelihood concerns, and faith in institutions. Previous studies have demonstrated that impediments to environmental action are related not only to knowledge but also to social, economic, and institutional factors (Kollmuss & Agyeman, 2002). In this respect, the KAP framework is valuable but needs to be taken with a grain of salt: locals may be supportive of conservation in theory. However, individuals may have difficulty consistently practicing conservation when rules are unclear, livelihood alternatives are limited, or enforcement is perceived as unequal.

The larger literature also influences the study of community engagement and governance of protected areas. Conservation scientists have emphasized that protected areas are more likely to gain public support when local communities are actively involved, governance arrangements are transparent, and conservation benefits are shared equitably (Berkes, 2009; McGinlay et al., 2023). Community engagement is thus not only an administrative obligation but a condition that may enhance compliance, trust, and shared responsibility. This approach is relevant in the case of the Chocolate Hills Natural Monument, where conservation strategies connect with tourism, land use, local livelihood, and community identity. The literature indicates that both individual and environmental variables determine conservation behavior. Pretty (2003) stated that the communal management of natural resources partly relied on social capital, collaboration, and shared norms. Similarly, Berkes (2009) indicated that co-management is more efficient when knowledge development, bridging organizations, and social learning occur. These findings show that communities may be more likely to engage in conservation behaviors when they are considered not only as rule receivers but also as collaborators in environmental stewardship.

Studies on pro-environmental behavior also indicate that knowledge and favorable attitudes are necessary, but not necessarily sufficient. Kollmuss and Agyeman (2002) highlighted that the discrepancy between environmental concern and environmental action might be attributed to practical constraints, conflicting priorities, and institutional conditions. Cheng et al. (2019) observed that community engagement in a tourism and protected-area setting might help connect residents' sentiments toward sustainable tourism with ecologically responsible behavior. This conclusion is pertinent to the Chocolate Hills, where tourism is both an economic opportunity and an ecological threat.

Empirical research in protected areas also highlights the relevance of trust, perceived advantages, and governance quality. For example, McGinlay et al. (2023) identified social factors such as knowledge, trust, and the perceived legitimacy of government institutions as drivers of public support for

protected areas. Solomon et al. (2015) also pointed out that non-compliance with conservation standards is seldom only due to a lack of understanding. It can also be linked to social and institutional circumstances that influence the way individuals interpret legislation. The findings show that conservation policies are more likely to succeed if they are communicated effectively and implemented in ways that communities perceive as fair and responsive. Philippine studies also support the evaluation of KAP in protected-area and natural-resource settings. Agtong et al. (2022), in their research of communities in the Lake Mainit Watershed, revealed that knowledge, attitudes, and behaviors are effective markers for assessing community participation in conservation. Butiong and Butalid (2021) found that community engagement in conservation associated with ecotourism may be enhanced when locals see economic and environmental benefits. Similarly, Punzalan (2020) emphasized the significance of environmental awareness and education in influencing the environmental habits of Filipino learners. Most recently, Balanay et al. (2025) have demonstrated that socioeconomic and communal well-being factors drive the desire to participate in conservation activities.

Taken together, the literature indicates that conservation practices are associated with more than simple awareness of environmental rules. Knowledge may support favorable attitudes, and favorable attitudes may encourage conservation practices, but these relationships are shaped by education, residence, livelihood, local governance, and perceived benefits. In the case of the Chocolate Hills Natural Monument, this study contributes by quantitatively examining community knowledge, attitudes, and practices toward protected area policies in a highly visible conservation and tourism landscape in the Philippines. The study therefore provides evidence that may help inform environmental education, policy communication, and participatory protected area management.

METHODOLOGY

Research Design. This study employed a quantitative, cross-sectional research design to examine community knowledge, attitudes, and conservation practices (KAP) toward protected area policies in the Chocolate Hills Natural Monument (CHNM), Bohol, Philippines. The design was appropriate because it enabled the systematic description of respondents' knowledge, attitudes, and practices, as well as the examination of relationships among these variables and selected demographic characteristics. The study adopted the Knowledge–Attitudes–Practices (KAP) framework as its conceptual basis for understanding how environmental knowledge and attitudes may be associated with conservation practices.

Study Area and Participants. The study was conducted in six municipalities surrounding the Chocolate Hills Natural Monument: Carmen,

Batuan, Bilar, Sagbayan, Clarin, and Catigbian. These municipalities include communities located within the core and buffer zones of the protected area and therefore represent populations that regularly interact with conservation policies and management interventions.

The target population was the adult residents of the specified localities. Respondents were selected from the six municipalities using stratified random sampling. A survey was conducted among 500 people. Stratification facilitated proportional representation of communities and minimized potential sampling bias related to geographic location.

Research Instrument. Data were collected using a modified Knowledge–Attitudes–Practices (KAP) questionnaire developed from the provisions of Republic Act No. 11038 (Expanded National Integrated Protected Areas System Act of 2018) and the Department of Environment and Natural Resources Administrative Order No. 2016-26, which provides guidelines for conducting KAP surveys in environmental management.

The questionnaire had three sections. The first portion examined respondents' knowledge of protected area rules, environmental regulations, and conservation concepts. In the second phase, views towards environmental preservation were measured using a five-point Likert scale from Strongly Disagree to Agree Strongly. The final element examined self-reported conservation activities linked to environmental stewardship and adherence to protected area rules. Content validity was ensured by the examination of the instrument by specialists in environmental management and research methods. After the expert evaluation, the questionnaire was translated into Cebuano to improve respondents' understanding and pilot-tested before the main survey. Reliability analysis showed that all the main dimensions had adequate internal consistency with Cronbach's alpha scores of 0.744, 0.734, and 0.802 for knowledge, attitudes, and conservation behaviors, respectively, suggesting good reliability for research use.

Data Collection. Permission to conduct the study was obtained from the appropriate institutional and local authorities before data collection commenced. Survey questionnaires were administered in person by the researcher after explaining the study's objectives and obtaining informed consent from all participants. To minimize language barriers, questionnaires were administered in Cebuano whenever necessary, allowing respondents to answer in the language they were most comfortable with.

Completed questionnaires were reviewed for completeness before encoding into the Statistical Package for the Social Sciences (SPSS) for analysis.

Data Analysis. Descriptive statistics, including frequencies, percentages, weighted means, and standard deviations, were used to summarize respondents' demographic characteristics and describe their levels of knowledge, attitudes, and conservation practices.

Because the study variables were measured primarily using ordinal scales

and preliminary assessment indicated that parametric assumptions were not fully satisfied, nonparametric statistical procedures were employed. Spearman’s rank-order correlation was used to examine the relationships among knowledge, attitudes, and conservation practices. The level of statistical significance was set at $p < .05$ for all inferential analyses.

Ethical Considerations. Ethical approval for the study was obtained from the University of Bohol Research Ethics Committee prior to data collection. Participation was voluntary, and informed consent was obtained from all respondents before administering the questionnaire. Participants were informed of the purpose of the study, their right to decline to participate or withdraw at any time, and that their information would be handled confidentially.

To protect respondents’ privacy, completed questionnaires were anonymized during data processing, and electronic datasets were stored in password-protected files accessible only to the research team. Data were used exclusively for research purposes and were managed in accordance with established ethical principles governing research involving human participants.

RESULTS AND DISCUSSION

Community Knowledge, Attitudes, and Conservation Practices Toward Protected Area Policies. The respondents demonstrated a **moderate level of knowledge** regarding protected area policies implemented within the Chocolate Hills Natural Monument. Although many residents appeared familiar with the general objectives of environmental protection, the findings suggest that awareness of specific conservation policies and management mechanisms could still be strengthened. This observation is consistent with previous studies indicating that community knowledge is an important foundation for effective participation in protected area governance and compliance with environmental regulations (Agtong et al., 2022; McGinlay et al., 2023).

Table 1. *Descriptive Statistics of Community Knowledge, Attitudes, and Conservation Practices Toward Protected Area Policies (N = 500)*

Variable	Mean	SD	Interpretation
Knowledge	8.748	3.729	Moderately knowledgeable
Attitudes	3.844	0.906	Positive
Conservation Practices	3.092	1.113	Moderately practiced

Note. Composite descriptive statistics based on the survey results.

Respondents likewise exhibited **positive attitudes** toward protected area conservation. Overall, they recognized the importance of conserving the Chocolate Hills and expressed support for environmental protection

despite potential restrictions associated with protected area management. Positive environmental attitudes are important because they promote public acceptance of conservation policies and encourage cooperation between local communities and conservation institutions (Berkes, 2009).

Despite these encouraging perceptions, conservation practices were only moderately demonstrated. This finding suggests that although respondents generally supported conservation initiatives, favorable attitudes did not always translate into consistent conservation behavior. Environmental actions are often influenced by practical circumstances such as livelihood dependence, availability of environmental programs, accessibility of information, and opportunities for community participation. Consequently, improving conservation behavior may require not only increasing environmental awareness but also strengthening institutional support and participatory governance mechanisms (Kollmuss & Agyeman, 2002; Pretty, 2003).

Relationships Among Knowledge, Attitudes, and Conservation Practices. The correlation analysis revealed statistically significant positive relationships among knowledge, attitudes, and conservation practices. Respondents who demonstrated greater knowledge of protected area policies also tended to express more favorable conservation attitudes. Likewise, respondents with higher levels of knowledge generally reported stronger conservation practices. These findings support the Knowledge–Attitudes–Practices (KAP) framework, which posits that knowledge fosters favorable attitudes that may, in turn, encourage environmentally responsible behavior (Launiala, 2009).

Table 2. *Spearman Rank–Order Correlations Among Knowledge, Attitudes, and Conservation Practices*

Variables	Spearman's ρ	p	Interpretation
Knowledge and Attitudes	.508	< .001	A moderate positive relationship
Knowledge and Conservation Practices	.598	< .001	A moderate positive relationship
Attitudes and Conservation Practices	.573	< .001	A moderate positive relationship

Note. Spearman's rank-order correlation coefficients. All relationships were statistically significant at the .01 level.

The positive correlation between attitudes and conservation practices shows that citizens who supported conservation policies were more likely to participate in environmental protection initiatives. Nonetheless, the modest magnitudes of the correlation coefficients suggest that variables other than knowledge and attitudes influence conservation behavior. Socioeconomic circumstances, institutional trust, perceived fairness of environmental policies, and possibilities for community engagement may all influence conservation behavior in protected regions (McGinlay et al., 2023; Berkes, 2009). Overall, these findings support prior research indicating that successful protected area

management requires not only an understanding of the environment but also long-term partnerships between conservation organizations and residents (Pretty, 2003; Agtong et al., 2022).

CONCLUSION

The study provides evidence that communities surrounding the Chocolate Hills Natural Monument generally recognize the importance of environmental conservation and hold positive attitudes toward protected-area policies. While respondents exhibited moderate levels of knowledge and conservation practices, the findings suggest that there remains room to strengthen policy awareness and encourage broader participation in conservation-related activities. The significant positive relationships among knowledge, attitudes, and conservation practices indicate that these dimensions are meaningfully associated, supporting the usefulness of the Knowledge–Attitudes–Practices framework in understanding community responses to protected area governance. At the same time, the moderate strength of these relationships suggests that broader social, institutional, and livelihood-related factors also shape conservation behavior.

The observed disparities in selected demographic factors suggest that community involvement techniques may be more effective when tailored to the diverse experiences, educational backgrounds, and local circumstances of different populations. Overall, the findings highlight the need for environmental education, participatory governance, and ongoing stakeholder involvement to build community support for the maintenance of protected areas. These initiatives may help implement conservation measures more effectively and acknowledge the critical role of local communities as partners in conserving the Chocolate Hills Natural Monument’s ecological and cultural value.

RECOMMENDATIONS

Based on the findings of the study, the following recommendations are respectfully offered:

1. **Strengthen environmental education and policy communication.** Protected area managers, local governments, and partner organizations may want to improve community-based environmental education programs to provide clear, easy-to-find information on community rules and responsibilities in protected areas.
2. **Promote inclusive community participation.** Residents’ participation in conservation planning, environmental monitoring, and decision-making may lead to greater community ownership and support for protected area management initiatives.
3. **Strengthen partnerships among stakeholders.** Continued collaboration among the Department of Environment and Natural

Resources, local government units, academic institutions, civil society organizations, and community leaders may help sustain conservation initiatives while balancing environmental protection with local development priorities.

4. **Undertake further quantitative and longitudinal research.** Future studies may examine additional social, institutional, and economic factors that influence conservation behavior and explore changes in community knowledge, attitudes, and practices over time. Such investigations may contribute to a deeper understanding of community engagement in protected area governance and provide further evidence for adaptive conservation planning.

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