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LOCALIZED PROTECTED AREA MANAGEMENT FRAMEWORK FOR MT. APO NATURAL PARK, BARACATAN, TORIL, DAVAO CITY

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ABSTRACT
An empirically derived Localized Protected Area Management Framework was developed in this research to address the Mt. Apo Natural Park (MANP), Baracatan, Toril, Davao City, particular case, employing an exploratory data collection process centered on stakeholders' perceptions about governance, law enforcement, visitor management, tourist pressure, and ecological conditions. Structured in a quantitative descriptive research, data were collected in a Likert-scale type social survey submitted to 150 randomly selected stakeholders, analyzed applying Exploratory Factor Analysis in the SPSS statistical package software (Principal Components Analysis, applying Varimax rotation method). The data set was found to have an optimal suitability level to undergo factor analysis, presenting a high value in the Kaiser-Meyer-Olkin Index (KMO = 0.895), and the significance level was found in Bartlett's Test of sphericity. This proposed five feasible factors, explaining a total of 72.781% of the variance in a rotated component matrix array, that following this research's rationale may be defined as follows: factor 1, namely visitor management in relation to conservation, factor 2, concerning participatory governance, co-ordination, and conflicts management, factor 3, related to capacity building in law protection, factor 4, relating to tourist impact, threat to degradation, and factor 5, about rights-based governance, zonation, and controls in opposition to illegal activities. This five factor domain was used to propose an intervention-program in this research, formulated considering in a 12 months period the specific necessities in the parameter of action in accordance to the implementation process of the ENIPAS Act, consisting in a pro, in monitoring and evaluation outputs, to assist feasible improvements in relation to action capacities in these entities like PHP/NP, PAMB, EMB, LGU, in addition to those of the NCIP/IPs, and law enforcement agencies generally. Overall, the framework sets the effectiveness of the management in MANP within an overall system that correlates operational capability with legitimate governance alongside operational visitor controls that ensure risk mitigation for long-term socio-ecological outcomes.

Keywords:
Mt. Apo Natural Park; protected area management; ENIPAS; exploratory factor analysis; governance and participation; visitor management; tourism pressure; rights-based conservation

INTRODUCTION

Protected Areas (PAs) are critical to halting biodiversity loss and upholding ecological services essential to human health. "By 2030, 30% of land and sea must be 'effectively conserved and managed,'" as outlined in the Kunming-Montreal Global Biodiversity Framework (GBF). This indicates an overarching commitment to equitable management and achievement-oriented (Targets 1, 2, and 3). (Biological Diversity Convention (CBD), 2024).

In the Philippines, the Expanded National Integrated Protected Areas System (ENIPAS) Act of 2018 required site-specific management plans and monitoring, updated zoning and enforcement provisions, and institutionalized Protected Area Management Boards (PAMBs) to strengthen governance (Republic Act No. 11038). Localizing governance models, connecting PAs with nearby local government units (LGUs), and involving Indigenous Peoples (IPs) and communities in decision-making are all made possible by these reforms. (RA 11038, 2018; DNR-BMB, n.d.). Mount Apo Natural Park (MANP) is a legislated PA extending over the Davao Region and Soccsksargen areas. MANP is a biodiversity hot spot and cultural landscape with a prime trekking destination, but it is also faced with the challenge of tourism recovery use and settlement encroachment, and thus needs a localized or context-driven management approach attuned to the specific socio-ecological context of specific areas within the site, like Baracatan, Toril, and Davao City. Recent research at Mt. Apo Natural Park clearly

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indicates its significant conservation worth, as well as a need for adaptive management of visitor use. Biodiversity evaluations demonstrate a clear presence of tree species, including endemics and threatened ones in disturbed habitats, thereby further establishing conservation worth of this park for biological systems (Zapanta et al., 2019). In addition, research on trekking-carrying capacity offers practical grounds for mitigating this impact of visitors, thereby enabling informed trail management (Buenaflor, 2020).

Sound governance and effective management are as crucial at the global level as official designation. Although recent studies highlight how participation and decentralization influence social and ecological performance, mechanisms such as the Management Effectiveness Tracking Tool (METT) and counterpart DENR-BMB technical bulletins have been applied to systematically monitor and enhance PA performance. Huber, M., Newig, J., & Loos, J. (2023); BMB, 2016). In this context, this quantitative research seeks to create and test a Localized Protected Area Management Framework for MANP targeting Baracatan, Toril, Davao City that incorporates governance, management capacity, stakeholder engagement (including IPs), compliance/enforcement, funding, and tourism pressure into an empirically obtained logically consistent structure with the aid of exploratory factor analysis (EFA).

OBJECTIVE OF THE STUDY

This study aims to develop a framework of localized protected area management best fits the governance and operational realities of Mt. Apo Natural Park in Baracatan, Toril, Davao City. Specifically, it will answer the following questions:

1. What latent dimensions underlie localized protected area management that best fit the governance and operational realities of Mt. Apo Natural Park in Baracatan, Toril, Davao City?
2. What items (indicators) validly measure each dimension of localized PA management?
3. What framework can be developed base on the findings of this study?

REVIEW OF RELATED LITERATURE

In this manner, this chapter pulls together current literature and policy grounds for the Localization of Protected Area Management Framework for Mt. Apo Natural Park (MANP), Baracatan, Toril, Davao City. World wide, the Kunming-Montreal Global Biodiversity Framework (GBF) highly stresses increasing coverage of protected areas with a focus on improving effectiveness, equity, and rights-based governance, including meaningful participation of Indigenous Peoples and local communities in making decisions for conserving biodiversity (Convention on Biological Diversity [CBD], 2022).

Specifically, for the Philippine setting, the enumeration is consistent with the Expanded National Integrated Protected Areas System (ENIPAS) Act and its Rules and Regulations (DENR Administrative Order 2019-05) because they enhance the Protected Area Management Boards (PAMBs). Taken together, these international and domestic directions inform a localized approach that considers protected area outcomes as more than just biological objectives, but rather as a reality of governance.

Visitor Management.

There has been growing scholarship on visitor management being considered a direct conservation tool, particularly in heavily used protected areas where the cumulative effects of recreational activity have a daily impact. Moreover, the goal of biodiversity conservation is no longer considered a theoretical end point indeed, studies on protected areas have indicated that the efficacy of the end point is often tied to the strength of the visitor management system offered: permit and fee structures, orientation and compliance programs, and the construction and maintenance of trails and visitor facilities to manage recreational activity in less impactful ways. For example, the condition and levels of visitation have long been used to monitor the effects on vegetation and soil and ground instability (Dragovich & Bajpai, 2022). Related to this study, Pásková, M., Wall, G., Zejda, D., & Zelenka, J. (2021) emphasized that there is also a need to emphasize that studies on tourism carrying capacity highlight that protected areas are tourist destination systems where there must be a constant balance between tourist demand and capacity, and where tourist activities must be compatible with nature.

Another recent study also emphasizes the need for responsive visitor control in keeping with changes in visitor movement and congestion, as variations in visitor numbers may enhance enforcement efforts and necessitate mechanisms for visitors, including booking systems, site restrictions, and communication tools (Medina-Chavarria & Gutiérrez, 2024). Moreover, Roos, C., Alberts, R., & Retief, F. P. (2025) highlighted that there is a current literature shift towards considering waste management a primary function of conservation, as it is viewed from a secondary housekeeping perspective. Complexly governed protected areas find it difficult to align “no

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littering" policies with practical programs, making current efforts assess management plans on whether they develop specific waste principles, responsibilities, targets, and monitoring indicators for consideration. Together, these studies support the factor-based analysis that conservation becomes "visible" and credible to stakeholders as a result of orderly, well-maintained, and consistently enforced visitor management systems.

Participatory Governance, Coordination, and Conflict Handling

However, there is an emerging consensus in the literature on protected area governance that participation is not merely a matter of procedure but has consequences for ecological and social outcomes when participation is meaningful, accountable, and linked to influence over decision-making. A recent systematic case survey of evidence relating to protected area governance reports that benefits to outcomes from participation can occur where participation involves transparent decision-making, real opportunities to shape management action, and mechanisms for dealing with trade-offs between conservation and local livelihoods (Huber et al., 2023).

This matters directly to MANP because a multi-actor governance structure like the PAMB is evaluated not only by the presence of meetings or representation, but by whether stakeholders feel their concerns shape what the park does in substance through monitoring systems, access to information, and functional grievance pathways. A complementary global study also reinforces this argument by suggesting that community involvement and equitable governance show strong associations with more effective outcomes in multi-use protected areas, indicating that legitimacy and cooperation generally hold as much importance as deterrence in achieving compliance and protection results (Fidler et al., 2022). Taken together, recent evidence suggests that participatory governance is most effective when it is perceived as responsive and fair, when coordination across agencies is operational rather than symbolic, and when mechanisms for resolving conflict minimize friction between conservation mandates and local socio-economic needs.

Protection Capacity and Operational Readiness

A substantial body of evidence suggests that the effectiveness of protected areas is also limited by human resources, rather than solely by policy and operational capacity. This was highlighted in a significant cross-national study published in the journal Nature Sustainability, which indicates that the number of staff and park rangers still falls short of the present global standards set for the management of protected areas, and that scaling-up conservation objectives without adequate staff risked dampening the effectiveness of enforcement, monitoring, and management (Appleton et al., 2022). In reality, this literature relates to the "readiness" factor, where stakeholders assess the effectiveness of protection based on visible indicators such as trained personnel, sufficient patrols, and functioning equipment.

A recent study by Kuiper, T., Dancer, A., Beale, C. M., et al. (2025) highlights that training and presence are also important for reasons other than enforcement. The value of ranger-based monitoring is also enhanced through professionalization, with clear objectives and the use of results for informed decision-making. This reiterates the logic that preparedness does not mean "just having rangers," but also must address whether rangers and park staff can operate reliably and effectively, and importantly, during periods of high visitation, where increased demands exacerbate both the risk and the need for active park management.

Tourism Pressure and Environmental Degradation Risks

Studies on the impact of tourism has grown to view the issues of waste, congestion, and trail deterioration as being interlinked and intensifying as a consequence of repeated use and poor control on the land. Evidence-based syntheses reveal that recreational use influences both the biotic and abiotic elements through certain mechanisms like habitat alteration, soil compaction, erosion, and pollution, thus suggesting the view that press tourist influences can cumulatively lead to ecological degradation (Sardar & Islam, 2025). Similar findings indicate that crowded conditions are a problem in the visitor experience, but they also create a management challenge that leads to rule-breaking, site degradation, and increased operational challenges, including waste and trail management (Medina-Chavarria & Gutiérrez, 2024). Research studies carried out to determine trail impacts also support the above argument, as they show that protected areas can utilize indicators to trigger actions such as trail rerouting, upgrading, closure periods, and redistributing tourists (Dragovich & Bajpai, 2022).

On the same note, studies on planning that focus on protected areas stress that the concern about waste has remained since it was identified in the management plans of these areas as a threat, without a clear definition of the concern and its actions in relation to the factor (Roos et al., 2025). In general, the current literature sustains the factor interpretation that the Tourism Pressure factor is not seen by the stakeholders as something incidental; instead, it views it as a unitary degradation process which demands active regulation.

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Rights-Based Governance, Zoning, and Anti-Illegal Activity Control

Right-based conservation literature asserts that effective long-term conservation gains when governance structures position Indigenous Peoples and local communities as rights-holding entities, rather than merely beneficiaries, with governance structures accountable as duty-bearers for participation, inclusion, and conservation guarantees (Sarmiento Barletti & Prouchet, 2023). In protected areas such as MANP, this view enhances the expectation that zoning and law enforcement are best delivered in association with legitimacy, especially within positions of decision making and consultation processes reflective of Indigenous culture.

The literature on compliance also supports the above link by showing that the intention to comply is not only affected by sanctions but also by procedural justice and rule legitimacy; often, more effective enforcement is achieved when the rules are predictable, certain, and perceived to be just (Ibbett et al., 2025). Finally, the study on zoning has shown that the zones for the protected areas can have various impacts that can be measured using remote sensing, confirming the notion that zoning is more than administrative work, given that its efficiency can be estimated using ecological measures for the several types of zones (Rivarola et al., 2022).

Mount Apo Natural Park (MANP) Studies

As one of the top protected areas in the Philippines, Mount Apo Natural Park (MANP) has been at the center of several studies related to ecology and management. Based on several researches, this natural park has significant use values in terms of biodiversity, including it in the category of cultural landscapes jointly appreciated by IPs, communities, and tourist sectors (Zapanta et al., 2019). However, with mounting recreational use and utilization of natural resources, there has been concern over disturbance and natural capacity limits (Buenaflor, 2020). Observations suggest a need to control visitor flows, improve waste management, and monitor carrying capacity to ensure sustainable use of visitor resources. Economic studies, as exemplified in a model completed by Liu et al. in 2021, further hypothesize that fees paid by climbers and other users could be a justifiable source of funds, contingent upon proper management and redirection to conservation efforts.

Conceptual foundations.

The International Union for Conservation of Nature (IUCN) provides a theoretical framework that classifies governance into four types, such as state, shared, private, and Indigenous or community governance, each with varying degrees of authority and accountability (IUCN, 2016/2019). This framework emphasizes that conservation effectiveness improves when power and responsibilities are equitably distributed among actors with legitimate stakes in the area. For Mount Apo Natural Park, where multiple governance interfaces exist between Indigenous Peoples (IPs), LGUs, and national agencies, the IUCN typology is particularly relevant. It provides a conceptual foundation for developing a localized protected area management model that integrates legal mandates, social participation, and ecological objectives.

Theory Base

This research is grounded in the Social-Ecological Systems (SES) theory, using Ostrom's Social-Ecological Systems Framework (SESF). The SESF model looks at the Protected Areas (Pas) as a unified system consisting of resource systems (ecosystems), resource units (species and habitats), governance systems (Protected Area Management Boards, Local Government Units, and Indigenous Cultural Communities), and users (households, Indigenous Peoples, and tourists), and their interactions. Recent SESF syntheses and effectiveness frameworks for management effectiveness (such as the World Commission on Protected Areas/Management Effectiveness Tracking Tool) provide a quantifiable set of constructs for management effectiveness, summarized for inputs, processes, outputs, and outcomes. In extant literature on the topic of participatory governance, important aspects of design influencing both compliance and outcome are outlined (BMB, 2016; Huber et al., 2023).

METHODOLOGY

This study adopts a quantitative, exploratory research design, specifically utilizing Exploratory Factor Analysis (EFA). The study seeks to determine the factors that define the localized management of the protected areas within the Mount Apo Natural Park in Baracatan, the Mount Apo Natural Park within Toril, and the Davao City. Similar to the study conducted by Wusqo et al. (2022), which utilized EFA to determine the latent factors of environmental awareness within the context of local wisdom, the current study utilized EFA to determine the underlying factors of protected area management in Mt. Apo. A researcher-designed 30-item instrument, utilizing a 5-point Likert scale, captured views on governance or participation, management capacity or resources, compliance or enforcement, financing, tourism pressure or visitor management, and perceived socio-ecological

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outcomes. Responses were coded, tallied, and analyzed using IBM SPSS Statistis. Before factor extraction, sampling adequacy was assessed with the Kaiser–Meyer–Olkin (KMO) measure, and the suitability of the correlation matrix was confirmed with Bartlett's test of sphericity (Shrestha, Noora, 2021). The Scree plot/Scree test guided factor retention by visualizing eigenvalues across components (Cattell, 1983).

RESULTS AND DISCUSSION

This section presents the factor analysis findings from the 30-item Localized Protected Area Management Framework for Mt. Apo Natural Park (MANP) survey. Using statistical techniques such as the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's Test of Sphericity. This section displays the analysis and interpretation of data.

KMO and Bartlett's Test

Table 1 shows the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and the Bartlett Test of Sphericity. The Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy is 0.895. This implies that the correlation between the items is fairly high and the variables share a lot of common variance, which helps in the identification of unknown factors. Moreover, A KMO value in this range is considered commendable, implying that this sample is adequate for factor analysis (Hair et al., 2019). Bartlett's Test of Sphericity is **significant, $\chi^2(435) = 4230.562$, $p < .001$.** Thus, there is a rejection of the null hypothesis regarding this test, implying that the correlation matrix is not an identity matrix. This finding confirms that there is not randomness in the correlation between the items used in this study that are adequate for factor extraction and are usable for factor extraction (Hwang et al., 2024). Taken together, the KMO and Bartlett's test result provides a good empirical justification to conduct EFA in this study, as it is revealed that the sampling characteristics are adequate, with considerable inter-item associations in the context of the questionnaire items raised in the study. (Sreedharan et al., 2024).

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.895
Barlett's test of Sphericity	Approx. Chi-Square	4230.562
	df	435
	Sig.	0

Table 1. KMO and Bartlett's Test

Scree Plot

Figure 1 shows the graphical explanation of the total variance explained and graph of the eigenvalues against all the factors. The eigenvalues across the 30 components and provides visual support for determining the appropriate number of factors to retain. The plot shows a very steep decline from Component 1 (≈12.19) to Component 2 (≈3.93), followed by a continued but smaller drop through Components 3–5 (≈2.59, ≈1.89, ≈1.24), indicating that the first few components account for most of the shared variance in the item set. Following Component 5, the curve clearly levels off, and the remaining components create a relatively flat "tail." This indicates that additional components provide only marginal explanatory value and are more in line with random error or item-specific variance than with meaningful latent structure. The visible "elbow" at the fifth component, along with the observation that only the first five components have eigenvalues exceeding the commonly used threshold, offers convergent evidence that a five-factor solution is the most parsimonious and interpretable representation of the dimensions measured by the localized protected area management scale (Hair et al., 2019; Hwang et al., 2024).

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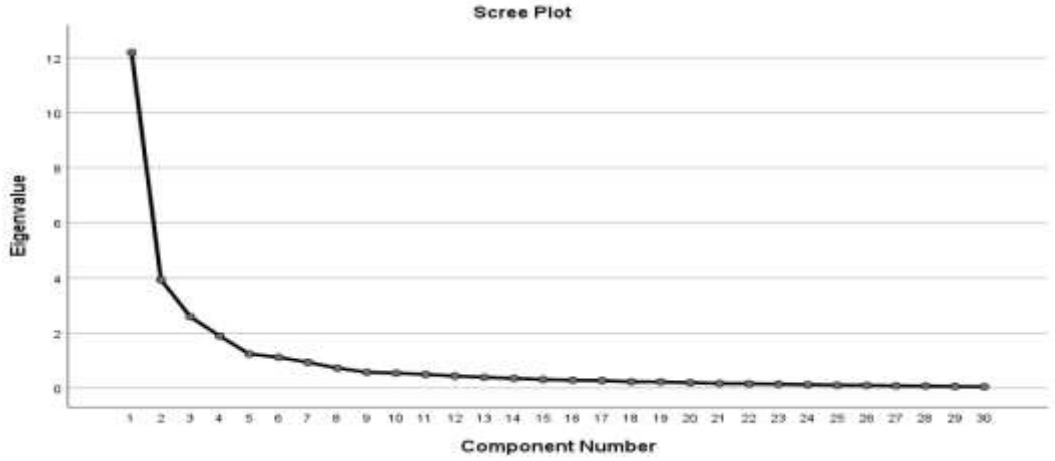

Figure 1. Scree Plot Rotated Component Matrix

Analysis of Variance Percentage

The findings in Table 2 present the analysis retained five components, each possessing an initial eigenvalue exceeding 1.00 (component 1 = 12.187; component 2 = 3.931; component 3 = 2.587; component 4 = 1.890; component 5 = 1.239). This means that they met the eigenvalue criterion that is most often used for EFA/PCA solutions. These five parts together make up a large part of the shared variance in the 30-item scale, explaining **72.781%** of the total variance (cumulative). This means that the extracted structure captures most of the important differences between items that have to do with how people think about managing protected areas in a specific area. It is important to remember that Component 1 is the most important part of the unrotated solution because it explains 40.625% of the variation. Components 2 to 5 add less and less (13.104%, 8.622%, 6.301%, and 4.129%, respectively). This shows that there is one "general" dimension and many more specific ones. After rotation, variance is more evenly spread out across components (26.695%, 17.160%, 11.876%, 8.683%, and 8.366%). This makes it easier to understand by showing which items go together. It is important to remember that rotation does not change the total variance explained (still 72.781%), but it does move variance around components to make a clearer and more conceptually meaningful factor pattern for discussion and framework-building.

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	12.187	40.625	40.625	12.187	40.625	40.625	8.009	26.695	26.695
2	3.931	13.104	53.729	3.931	13.104	53.729	5.148	17.160	43.856
3	2.587	8.622	62.351	2.587	8.622	62.351	3.563	11.876	55.732
4	1.890	6.301	68.652	1.890	6.301	68.652	2.605	8.683	64.414
5	1.239	4.129	72.781	1.239	4.129	72.781	2.510	8.366	72.781

Table 2. Total Variance Explained

Rotated Component Matrix

Visitor Management. Table 3 reflects strong loadings from items on visitor control, compliance and ecological condition. High-loading indicators include “Trail and campsite facilities are well-maintained” (λ =.857), followed by “Visitor permits and fees are properly managed and monitored” (λ =.852) They are closely followed by “Visitor permits and fees are properly managed and monitored” (λ =.842) and “Trekking and camping activities follow carrying-capacity guidelines” (λ =.815). Waste enforcement among visitors was similarly represented: “Waste management practices are effectively enforced among visitors” (λ =.799), plus ecological outcome indicators such as stable forest cover “Forest cover in Mt. Apo Natural Park is improving or stable” (λ =.793) and healthy watersheds “Watersheds and freshwater sources in the park remain healthy” (λ =.742). Wildlife

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conservation remains substantial: "Populations of key wildlife species are protected and conserved" (λ =.728).) followed by "Patrol frequency is adequate to deter illegal activities." (λ =.681). Operational compliance and coordination are also highlighted, as indicated by the statement "Tourism-related livelihood activities comply with park regulations" (λ = .677). Responsiveness to "LGUs and law enforcement agencies (PNP, NCIP) support park enforcement activities" (λ =.593) and visible enforcement "Sanctions for violators are consistently applied" (λ =.579). It implies that in MANP, protecting biodiversity is not seen as purely ecological; it is experienced as something that depends on daily visitor management discipline, especially in trails and campsites where impacts accumulate fast.

Factor	Attributes	Loading, λ
Visitor Management	Item 21 - Trail and campsite facilities are well-maintained.	.857
	Item 17 - Visitor permits and fees are properly managed and monitored.	.852
	Item 20 - Visitor orientation and guidelines are clear and well-communicated.	.842
	Item 18 - Trekking and camping activities follow carrying-capacity guidelines.	.815
	Item 19 - Waste management practices are effectively enforced among visitors.	.799
	Item 23 - Forest cover in Mt. Apo Natural Park is improving or stable.	.793
	Item 25 - Watersheds and freshwater sources in the park remain healthy.	.742
	Item 24 - Populations of key wildlife species are protected and conserved.	.728
	Item 16 - Patrol frequency is adequate to deter illegal activities.	.681
	Items 22 - Tourism-related livelihood activities comply with park regulations.	.677
	Item 15 - LGUs and law enforcement agencies (PNP, NCIP) support park enforcement activities.	.593
	Item 14 - Sanctions for violators are consistently applied.	.579

Table 3. Rotated Component Matrix with Grouped Attributes of Visitor Management

Findings reveal that respondents appear to tie conservation outcomes to the everyday "visitor system", not just to ecological protection in the abstract. The strongest loadings cluster around visible, routine, and controllable site conditions, particularly well-maintained trails or campsites, and proper management or monitoring of permits and fees, alongside compliance with carrying capacity and enforcement of waste management. In other words, people seem to experience "biodiversity protection" through what they regularly see and feel during their visitation: the condition of the facilities, the orderliness of the entry systems, and whether rules are actively enforced on the ground.

For Mt. Apo Natural Park (especially in the Baracatan–Toril context, this factor reads like a practical message: "If the flow of visitors is well managed, then the protection of the park becomes real. The forest cover and the health of the watersheds become believable outcomes" (as it applies to Baracatan and Toril). Meanwhile, the lower but still significant loadings refer to support and consistency of law enforcement, and the following can be presumed: the importance of consistency and cooperation in law enforcement being balanced by an understanding or perception that the respondents have placed significance on the availability and dependability of the system and the facility rather than the consistency of law enforcement and the cooperation of other agencies, because law enforceable and cooperation among agencies might be less consistent or uneven in daily experience. In this framework, it generally means that improving the management of visitor use (management of visitor facilities and use, including issuance of permits, park orientation, facility and park maintenance, waste management, and facility and park capacities) might indeed represent one of the most implementable directions for improving conditions for ecological protection that the community or other stakeholders might realistically monitor and discern.

A related study, focusing on protected areas and nature-based tourism, suggests that visitor management is a technique of conservation by regulating the intensity of usage and mitigating any negative effects to the biophysical environment. (Dragovich, 2022) Emphasizes the role of trails and fun activities, and argues that the concept of "carrying capacity" is still an essential tool for ensuring the cleanliness of such places. This is because

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the number of visitors and their behavior are directly related to trail decay, facility overload, and potential destruction, particularly within a sensitive ecosystem. Sustainability means providing locations to reside, work, and play, and also locations with regulations of usage. In a similar study, Velmurugan, S., Somasundaram, R., and Karthikeyan, P. (2021) demonstrate that regulating the effects of visitors, such as providing information, rules, and services at the site, is a crucial aspect of environmental protection. This is especially true for eco- and wildlife tourism, where it can impact visitor satisfaction and compliance with rules and regulations. Increasingly, protected areas are recognizing that maintaining cleanliness is a crucial part of managing and operating the area. Tourists who leave trash behind can hurt the ecosystem, even when people really want to protect it. A new article in the PARKS Journal states that how successfully plans for protected areas handle rubbish should be used to grade them. Furthermore, it suggests that guidelines should be established regarding who is responsible, the structures that need to be implemented to follow these guidelines, and the structures that should adhere to them (Roos et al., 2025). Generally, the effectiveness of conservation is often measured by the presence of systematic visitation management structures, among other aspects, such as maintenance and monitoring, because these are the practical elements that make the guidelines operational.

Participatory Governance, Coordination, and Conflict Handling. Table 4 shows a set of well-structured indicators related to the issue of governance that involve the participants' views on inclusiveness, transparency, coordination, and conflict resolution being addressed by the management of Mt. Apo Natural Park. It is clear that the loading is on “Stakeholders’ concerns are taken into account in management decisions” (λ = 0.830). This indicates that the key indicator of people's involvement is the responsiveness of the decision-makers to the views of the participants. It is followed by “Local communities feel empowered to contribute to park management” (λ = 0.785). This indicates that people's involvement is not only addressed through consultation but also expresses their empowerment within the communities to participate actively. Another important indicator is institutional effectiveness addressed by the statement “Monitoring and evaluation systems for park management are in place and functional” (λ = 0.705).. Conflict-handling capacities are represented by “There are clear grievance mechanisms for addressing conflicts related to park governance” (λ = .682), and transparency is captured by “Meetings and decisions of the PAMB are transparent and accessible to the public” (λ = .658). Inter-governmental and inter-agency coordination remains a meaningful dimension, reflected in “Park management effectively coordinates with LGUs and other agencies” (λ = .638) and “LGUs actively participate in PAMB meetings” (Item 2; λ = .559). Lastly, the factor extends into perceived outcomes, “Conflicts between livelihood activities and conservation goals are decreasing” (λ = .515), implying that stakeholders associate participatory and coordinated governance with reduced tension between protection mandates and local economic needs, albeit with a comparatively weaker loading that suggests this outcome may be more uneven or still emerging in practice.

Factor	Attributes	Loading, λ
Participatory Governance, Coordination, and Conflict Handling	Item 3 - Stakeholders’ concerns are taken into account in management decisions.	.830
	Item 5 - Local communities feel empowered to contribute to park management.	.785
	Item 11 - Monitoring and evaluation systems for park management are in place and functional.	.705
	Item 6 - There are clear grievance mechanisms for addressing conflicts related to park governance.	.682
	Item 4 - Meetings and decisions of the PAMB are transparent and accessible to the public.	.658
	Item 10 - Park management effectively coordinates with LGUs and other agencies	.638
	Item 2 - Local government units (LGUs) actively participate in Protected Area Management Board (PAMB) meetings.	.559
	Item 26 - Conflicts between livelihood activities and conservation goals are decreasing.	.515

Table 4. Rotated Component Matrix with Grouped Attributes of Participatory Governance, Coordination, and Conflict Handling

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The findings showed that it was possible to determine the outcome of the impact of the factor on the process of connectivity in terms of influencing perceptions on the governance of Mt. Apo Natural Park, with consideration of giving emphasis to the significance of inclusion. Apparently, it seems that it does not center on having all the meetings in place and the structure in place, but on the concept that these decisions made by management are well within the spirit of putting the needs of the people at heart. Moreover, the factor recommends that "good management and governance involve having functional processes for such aspects as monitoring and evaluation; access to information about decisions of PAMB; and having processes to express grievances in case of problems." These are positive indicators of fairly and honestly run management of the protected area. Also indicated in this factor is another important consideration: that of the reduced "livelihood and conservation conflicts." This suggests again that well-handled participation in governance helps address conflicts between conservation and livelihood issues, but this factor of conflict reduction results in mixed outcomes because of its reliance on much more than mere participation

More recent research literature about the management of protected areas reinforces the importance of the role of participation in improving the effectiveness of conservation with the actual involvement in the decision-making process rather than simple consultative involvement or even the gesture of involvement. Evidence synthesis has made it clear how better management can improve ecological and social effectiveness. Empirical evidence has shown that just and participation-oriented governance is linked to efficient multi-use protected areas, where the problem lies in managing conservation goals and local resource use. Open decision-making, coordination, and easily accessible conflict resolution contribute to decreased resistance and enhanced compliance, as a community is more willing to work together if it believes that a rule is just and a process is legitimate.

Protection Capacity and Operational Readiness. Table 5 embodies a strong "readiness" factor emphasizing whether Mt. Apo Natural Park possesses sufficient people power or capacity in terms of equipment for the effective delivery of protection mandates. The item with the highest loading in the table is "Rangers and staff receive regular training for effective park management" (λ = .909). This suggests that capacity development through training and development emerges as the most dominating characteristic of the factor. Closely trailing this item is "Park rangers are adequate in number to patrol and monitor the area" (λ = .878). This item strongly suggests an emphasis by respondents on effective management in terms of sufficient manpower for the ground operation and monitoring of the protected area. Support for ground operation in protected areas can be seen in "Equipment and facilities (e.g., patrol vehicles, monitoring tools) are sufficient to support management activities" (λ = .866). This item also suggests an emphasis by respondents on protection as capability rather than merely as a policy requirement needing equipment support. Notably, the inclusion of "The number of visitors is too high for the park's ecological capacity" (λ = .684) in the table introduces a "pressure" note into this particular factor. This item suggests an awareness by respondents of visitor pressure as an intensifier of workload, as the visitor influx mounts, so does the imperatives for equipment development based on the fear of ecological overload.

Factor	Attributes	Loading, λ
Protection Capacity and Operational Readiness	Item 8 - Rangers and staff receive regular training for effective park management.	**.909**
	Item 7 - Park rangers are adequate in number to patrol and monitor the area.	.878
	Item 9 - Equipment and facilities (e.g., patrol vehicles, monitoring tools) are sufficient to support management activities.	.866
	Item 27 - The number of visitors is too high for the park's ecological capacity.	.684

Table 5. Rotated Component Matrix with Grouped Attributes of Protection Capacity and Operational Readiness

Study reveals that the "effective protection" on the slopes of the Mount Apo Natural Park is a very hands-on kind of experience: do we actually have the right people on the ground to do the job and do they have the tools with which they can actually carry out the task? The grouping of the items under training of staff, number of park rangers deployed in the area, and the availability of the equipment indicates that the understanding of the importance of protection is not only focused on a plan or a statement outlining the policies on the subject but also on the capability to carry out the task with the skills of the people involved and the tools at their disposal among

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others. The "readiness" factor also reflects perceptions of visitor pressure. This means that park stakeholders realize that they are concerned with visitor pressure not only in terms of an environmental factor but also in terms of management. That is, when there is pressure in terms of visitation, there is greater pressure on park management to provide well-trained staff, patrol presence, and so on. In essence, it appears that respondents perceive that park management effectiveness in meeting protection mandates is tied to "readiness" every day since in protected areas, deficiencies in training, personnel, or equipment are often insights into immediate impact.

A recent study undertaken in protected areas illustrates the importance of management efficiency, not just in terms of policies and plans but also in terms of the role of the people and capacity. It has been observed in a study publication regarding nature sustainability that there is a considerable shortage of personnel in protected areas. This might impact the e overall management of protected areas considering the escalating demands and aims amid the setting of a constant rise (Appleton et al., 2022). It is evident from the literature that the phenomenon noticed is true. It is a common notion that personnel are always required to ensure the proper management of protection. Kuiper et al. suggest in a publication of 2025 that the efforts of the rangers in protected area management could be greatly enhanced when the teams work with clear-cut aims, have the capacity to make use of the collected information from the process of monitoring, and enjoy the support of the institution, ensuring the welfare of the rangers. Studies regarding the rising flow of visitors indicate the effect of the changes in the visitor flow rates in terms of not just exacerbating the problems of management but also causing strain due to congestion (Medina-Chavarria et al., 2024).

Tourism Pressure and Environmental Degradation Risks. Table 6 encapsulates a very specific impact-oriented factor which describes the recognition of the stresses associated with tourism by the stakeholders towards the Mt. Apo Natural Park's ecological balance and integrity. The factor's loadings show the greatest impact being associated with the following item: "Tourism generates waste that threatens the park's ecological balance" (λ = .872). This implies that stakeholders believe the accumulation of wastes is the major and most visible issue associated with the impact of tourism upon the park's ecological balance and integrity. The issue can be followed by the following item: "Visitor overcrowding negatively affects the park's natural environment" (λ = .812), This implies that stakeholders believe the presence and concentration of tourists affect the park's natural environment directly and have a significant correlation associated with the park's ecological balance and integrity. The factoring group's three hypotheses associated with factor six can be supported by the following assertion: "Tourism activities contribute to trail erosion and habitat degradation" (λ = .756), implying that the stakeholders associate the impact and usage of the park by tourists with the associated deterioration of the park's sanitation and habitats. The three high loadings associated with the three items above suggest very clearly that the stakeholders believe the impact of tourism should not be underestimated or ignored because the associated impact and effects of the stakeholders have been identified as a combination of dangers, wastes, and erosion associated with the park's habitats and natural environment.

Factor	Attributes	Loading, λ
Tourism Pressure and Environmental Degradation Risks	Item 30 - Tourism generates waste that threatens the ecological balance of the park.	.872
	Item 29 - Visitor overcrowding negatively affects the park's natural environment.	.812
	Item 28 - Tourism activities contribute to trail erosion and habitat degradation.	.756

Table 6. Rotated Component Matrix with Grouped Attributes of Tourism Pressure and Environmental Degradation Risks

Stakeholders view tourism impacts in Mt. Apo Natural Park as a linked set of pressures, rather than separate problems. When visitation increases, they first perceive the most obvious signals, especially waste, but they link these to wider ecological stress such as crowding-related disturbance and the progressive degradation of trails and adjacent habitats. That is, the respondents account for tourism as something that could eventually "wear down" the park through repeated use, in which small impacts add up into larger environmental risks if management will not act promptly. This finding is particularly meaningful for MANP because the indicators in this factor are tangible and can be measured at the local level. Waste along routes, crowding in key sites, and eroded trails are

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issues impacting the communities, guides, and regular park users can verify without the need for technical instruments. That implies the expectations by stakeholders are likely just as practical, stronger visitor-use controls, strict waste systems, and sustained trail and habitat protection, because these are the places where tourism pressure most clearly translates into ecological degradation.

Dragovich 2022 advocates for a "connected risks" concept. Related to recreation and protected areas alone, various studies reported that damaging overuse may take many different forms, including trail widening, loss of flora, changes to the soil, and erosion. Often, these impacts are more extreme when regulated levels are not set, if someone is not keeping a close eye, or if a system is not set up to prevent these impacts on a site level. Evidence synthesis has shown that recreation has a beneficial or harmful impact on both biotic and abiotic factors through mechanisms such as habitat disruption, soil compaction, dumping, and pollution, much as your variable combines waste, use, and trail impacts into a single dimension (Sardar & Islam, 2024). Recent work also positions waste as a governance issue in its own right. Protected areas increasingly need integrated waste strategies because unmanaged waste directly threatens ecological integrity while also degrading visitor experience and increasing operational burdens. Roos and colleagues propose principles and an evaluation framework for responsible waste management in protected areas, reinforcing the idea that park systems must treat waste control as a core conservation function rather than a minor housekeeping concern (Roos et al., 2025).

Rights-Based Governance, Zoning, and Anti-Illegal Activity Control. Table 7 shows a factor that combines rule-based protection, legitimacy, and recognition of rights in MANP. The highest loading factor is "Zoning regulations in Mt. Apo Natural Park are strictly implemented" (λ = .822), emphasizing the importance of clear geographical rules and strict implementation endemic in the definition of protection by the respondents. This is followed closely by "Illegal logging, poaching, and extraction of resources are effectively controlled" (λ = .767), emphasizing the importance of effective zoning as a factor in the capacity of the protected area to inhibit harmful activities. It is crucial to note, however, that the factor encompassing governance and rights considers the dimension of "Indigenous Peoples (IPs) are adequately represented in decision-making bodies related to Mt.Apo Natural Park" (λ = .630). This emphasizes the fact that the respondents consider the fact that IPs must have a say in high-stake decisions regarding MANP protection. In general, the loadings indicate that in MANP, it is not merely a question of punish-ishment and technical implementation of rules. Rather, it encompasses the legitimacy of rule implementation and inclusivity of the decision-making arena. Additionally, IPs' rights of representation fortify the social base essential to ensure lasting cooperation.

Factor	Attributes	Loading, λ
Rights-Based Governance, Zoning, and Anti-Illegal Activity Control	Item 12 - Zoning regulations in Mt. Apo Natural Park are strictly implemented.	.822
	Item 13 - Illegal logging, poaching, and extraction of resources are effectively controlled.	.767
	Item 1 - Indigenous Peoples (IPs) are adequately represented in decision-making bodies related to Mt. Apo Natural Park.	.630

Table 7. Rotated Component Matrix with Grouped Attributes of Rights-Based Governance, Zoning, and Anti-Illegal Activity Control

This factor states that the stakeholders of Mt. Apo Natural Park conceptualized "effective protection" by considering two key aspects simultaneously: first, there should be clear spatial governance, and second, there should be credible control over any illegal activities. Since the community is able to see that indeed the governancy follows the defined spatial regulation, particularly at locations wherein the regulation should be strictly enforced, then they would believe that the protected area is actually able to provide protection for the environment and shield it from damaging activities like illegal logging and hunting and quarrying. However, it is precisely this inclusion of Indigenous Peoples' representation in decision-making that raises this factor to more than simply "enforcement." The evident trend here seems to be that for these study participants, at least, there exists an element of legitimacy in which they perceive compliance with or protection of rights to be inextricably intertwined: in other words, they recognize that following rules will be more effective in the long run if they feel that they have been made with integrity and with input provided by rights-holders in this particular case, IPs in this environment.

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This result aligns with the integrated view of rule-based management and legitimacy. Rights-oriented conservation approaches argue that programs in conservation become more sustainable because they see Indigenous Peoples and Local Communities as rights holders instead of only as beneficiaries and because they are able to ensure institutions as duty bearers are accountable for participation and the protection of collective rights (Sarmiento Barletti et al., 2023). In this manner of thinking, inclusive representation is appropriate and the moral and political basis of protected area rules becomes stronger. In this case, this assists people to work together for their advantage in the long run because they will have the ability to do so.

Additionally, literature regarding compliance and enforcement indicates the following with regards to protected area outcomes: the administration of rules needs to be a factor of not just the use of sanctions but also the perceived notion of rule administration as a matter of fairness and legitimacy. Using a cross-country analysis, Ibbett et al. (2024) show that rule administration fairness and legitimacy matter in terms of compliance intention, suggesting the notion that more effective law enforcement is achieved when it is viewed as legalistic, predictable, and procedurally just. Finally, the efficiency of zones demonstrated by the literature explains the necessity for the actual implementation of zones as a real management tool; empirical analysis utilizing remote sensing verifies the capacity to determine whether different zones of protection achieve divergent results (Rivarola et al., 2022).

In conclusion, the five factors provide an integrated and locally relevant approach to the management of the Mt. Apo Natural Park (MANP) by correlating conservation success with proper control of visitors, collaborative and inclusive governance, effective capabilities, active mitigation of pressures from tourism development, and rights-oriented zone enforcement, taking into consideration the role of Indigenous Peoples in governance.

Framework based on the Findings

Figure 2 shows the Localized Protected Area Management Framework for Mt. Apo Natural Park (MANP), Baracatan, Toril, Davao City, which was extracted from the factor analysis in the study. This framework consists of five intertwined factors that depict how the effectiveness of management is perceived by the stakeholders on MANP, which include Visitor Management, Participatory Governance, Coordination, and Conflict Handling, Protection Capacity and Operational Readiness, Tourism Pressure and Environmental Degeneration Risks, and Rights-Based Governance, Zoning, and Anti-Illegal Activity Control. These factors encapsulate both the context realities of protected areas, which include the realities associated with governance, capacity, rights, or zoning, as well as the realities that exist on the grounds or associated with visitor systems in protected areas.

These findings suggest that, the framework satisfies that the effectiveness of protected areas for MANP is achieved not through one single activity, such as governance, protection, participatory governance, and rights-based zoning, which all work together through an effective system that involves “rules, people, and everyday operations.” On one side, participatory governance enables effectiveness through legitimacy, while protection capacity enables effective implementation, especially through patrols and monitoring, while rights-based zoning enhances compliance through credible implementation and linkage with local people, mainly because of its effectiveness within local society. On the other side, visitor management enables these and all other regulations mentioned above through tangible actions like permits, orientation, well-maintained trails, and regulation, while tourism pressure points out the danger that accrues due to the overload that is more than the park can manage, especially around visitors within MANP.

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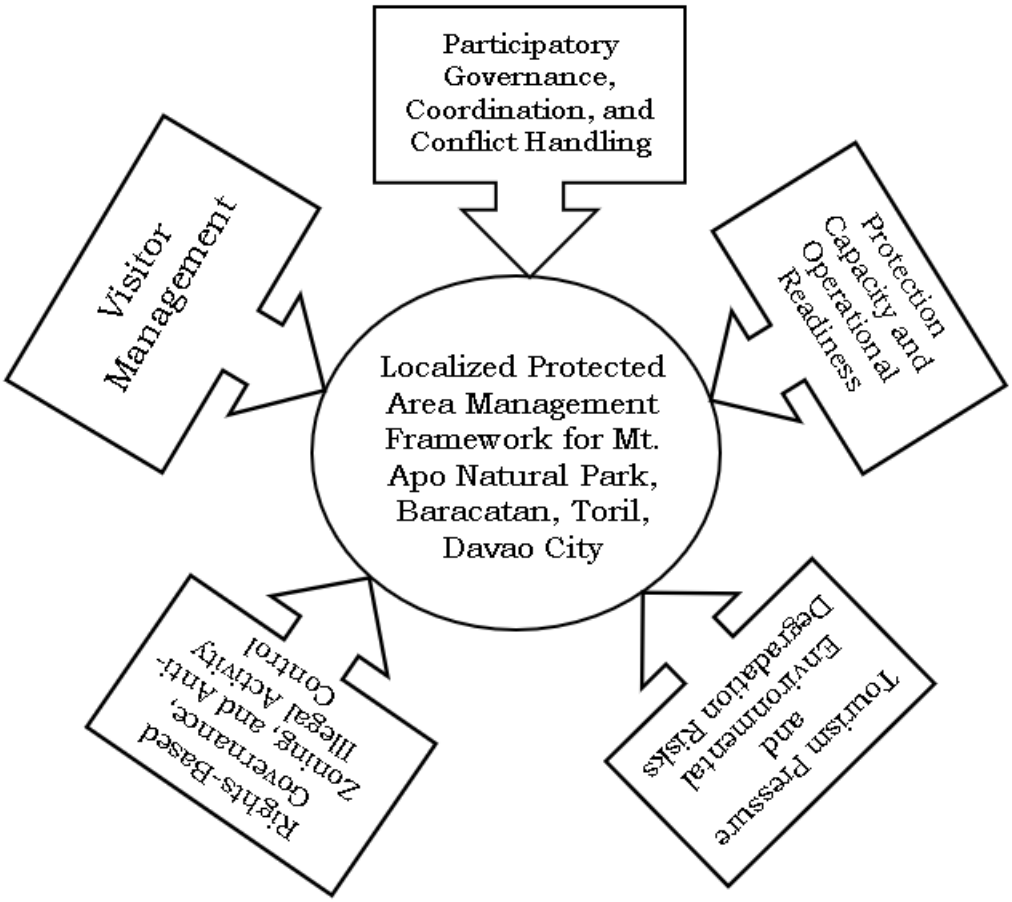

Figure 2. Framework Developed Based on Findings

Proposed Intervention Program. This section describes the proposed intervention program based on the five empirical dimensions of the localized PAM of Protected Area Management of Mt. Apo Natural Park (MANP), Baracatan, Toril, Davao City. The program seeks to interpret the EFA outcomes within the framework of an overall strategy aimed at improving visitor handling and conservation, the principles of governance and coordination, readiness capabilities, tourism impact regulation, and rights-based zoning and enforcement. It is intended to help the mandate and decision requirements of the DENR and PAMB within the framework of the ENIPAS Code while supporting the environmental monitoring role of the EMB.

Intervention Program Title: MANP Localized Management Strengthening Program (MANP-LMSP)
Program Description. The intervention program is an attempt to include the empirically generated localized framework for the management of Mt. Apo Natural Park. The results of the EFA analysis show that there are five related constructs of perceived management effectiveness of the park, which include: (1) visitor management and conservation, (2) governance and conflict management, (3) protection capability and preparedness, (4) tourism pressures and site degradation, and finally, (5) rights and management zones. Translating these domains into targeted actions supports DENR's policy implementation and monitoring under the ENIPAS Act, strengthens PAMB decision-making and coordination, aligns EMB's ecosystem-based monitoring efforts, and provides policy makers with measurable indicators to guide adaptive programming and budget allocation. The program also produces a replicable intervention model for future research on protected area governance and management effectiveness.

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Overall Goal. Enhancing management to better conserve Mt. Apo Natural Park through coordinated, rights-based, and evidence-based activities with full consideration of stakeholders' perceptions and actual ground conditions. This program thus aims at: (a) enhancing visitor management systems to ensure that people comply with rules and environmental protection; (b) institutionalizing participatory governance, transparency, coordination, and complaint handling; (c) enhancing protection capacity through structured training, optimization of staffing, and operations logistics; (d) reducing risks associated with damages brought about by tourism through waste, crowd, and trail/habitat impact controls; and (e) enhancing rights-based zoning and enforcement while IP representation and anti-illegal activities are also intensified.
Target Beneficiaries. Primarily, the park management units (PASu office, rangers), PAMB, IP communities, local communities, accredited guides/porters, and visitors. Secondary is the Local Government Units, EMB monitoring teams, NCIP, PNP, tourism operators, and policy makers. Lastly, Knowledge users: DENR, PAMB, EMB, researchers, planning and budgeting offices

Program Design and Components

Component 1: Visitor Management for Conservation Outcomes. This component would upgrade the already existing daily mechanisms to better translate the presence of visitors into an operational protection mechanism for Mt. Apo Natural Park. The project would upgrade the mechanisms related to the issuance of permits and financial operations to ensure higher levels of accountability and monitoring, provide operational mechanisms for visitor orientations to ensure higher levels of respect and compliance, and implement mechanisms for a regularly scheduled mechanism for the enforcement points relative to the adherence to the generated restrictions of the access points and areas of operations. There would also be a regularly scheduled mechanism relative to the trail and camp sites cleanliness, and, to the extent feasible, visitor capacities and mechanisms related to the management thereof because of the presence of a high volume of visitors.

Component 2: Participatory Governance, Coordination, and Conflict Handling. This component promotes and improves the effectiveness of decisionmaking and resolution, as well as grievance and mediation, through the following: The project shall institutionalize regular consultations for the systematic incorporation of stakeholder input into management decisions. It shall promote a public information and reporting package for increased clarity and transparency. It shall operationalize grievance and mediation processes for resolution of stakeholder complaints about access, livelihood, enforcement, and resource utilization. There shall also be coordination protocols to improve the implementation consistency of DENR, LGU, PNP, and NCIP through roles, lines of communication, and response mechanisms. Outputs include a stakeholder engagement plan, SOPs on grievances and mediation procedures, an inter-agency coordination matrix, and standardized public reporting templates that support consistent communication and accountability.

Component 3: Protection Capacity and Operational Readiness. This section is completely focused on ensuring the right staff, skills, and equipment are in place to protect the park under a range of field conditions. The program has a competency-based training approach that includes patrolling, monitoring, managing visitors for protection, reporting, and enforcing with a focus on conflict sensitive approach to enforcement. This phase would analyze the deployment of staff and efficient number of patrols required for different areas and times of the year to provide for the required amount of protection. This phase would also establish equipment standards with an inventory system to facilitate the purchase, management, and replacement of equipment. This phase would also develop a readiness plan with a system to explain how the plan would change when operating in busy periods or times of high risk with different concentrations of staff and the response routine. Outputs would include a yearly training plan, staff and patrol plan, equipment plan, through minimum operational standards for different times, and readiness checklists to ensure consistent performance in the field.

Component 4: Tourism Pressure and Degradation Risk Reduction. This component reduces the cumulative ecological impacts of tourism by targeting the most visible and irritating pressure points: waste, crowding, and physical habitat disturbance. This will put in place an integrated system for waste that will involve the establishment of specific rules and regulations, facilities, and mechanisms that will ensure that littering does not occur. It will ensure that there will not be overcrowding by means of site specific measures such as timed entry, routes, and seasonal opening based on the accessibility and agreement by the parties involved. It will incorporate ecological protection measures along the trails and habitats by hardening, redirecting, and taking rests on the portions that are most heavily utilized by the tourists visiting the site. Supported by EMB, the program will enhance impact monitoring and reporting so that its managers will be able to perceive early warning signs to

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trigger corrective actions. The key deliverables of this component are a waste management plan; protocols for the control of crowding, protection of trails and/or habitats; and a monitoring dashboard consolidating impact indicators for decision-making.

Component 5: Rights-Based Zoning and Anti-Illegal Activity Control. This component tries to contribute to improved rule of protection and legitimacy gained through governance and recognition of rights holders, especially the IP communities. This program will remind the rules of the zone and articulate them through approaches and methods accessible to communities and make them aware of these through boundary definition and ground signage to remove ambiguities regarding defined and prohibited zones and activities. This will improve anti-protection of illegal activities through the formulation of joint patrol and rapid response programs associated with other agencies and linked with report mechanism and documentation formats. Thirdly, this aims to improve legitimation of rights-focused governance through ensuring the formulation of particular rules involving the IP community in an appropriate connection with decision-making spaces concerning the park's management and governance. Lastly, but not less important, this aims to codify the rules of sanction and enforcement procedures in relation to legitimacy and equity considerations. The associated outputs of this component are as follows: package of enforcement of the zone; joint operations plan of actions; protocol of participation of IPs; and sanction SOP concerning legitimacy and compliance issues.

Implementation Plan and Work Schedule

This section presents the implementation plan and 12-month work schedule for the proposed intervention program for Mt. Apo Natural Park (MANP), Baracatan, Toril, Davao City. The schedule organizes activities into three practical phases to ensure readiness, timely delivery of outputs, and continuous improvement.

Phase 1, Setup. Involves meeting organizational goals of teams, protocol finalization, basic assessment, and mechanisms of coordination.

Phase 2: Rollout. Implements the key interventions through the following: Visitor management, governance, capacity building, risk reduction in tourism, or zoning.

Phase 3: Consolidation and Evaluation. Enhances the consolidation phase by making improvements while also conducting an end-line evaluation to facilitate institution development beyond the program. Program Duration

Monitoring and Evaluation Framework

The program will use a results-based approach to monitoring and evaluation that links performance indicators to the five management domains that have been proven to work and the reporting needs of Mt. Apo Natural Park that are based on ENIPAS. This method makes sure that monitoring isn't just descriptive; it also helps adaptive management by keeping track of whether changes in governance quality, operational performance, compliance, and ecological risk conditions are happening as a result of interventions. By connecting indicators to the program's results, the offices that carry out the program can figure out what is working, where things need to be changed, and where resources should be focused.

Reporting frequency and review process. There will be a structured cycle for monitoring to balance regular accountability with occasional reflection. The program will send out monthly operational reports to show any problems that come up right away and trends in the field. Quarterly PAMB progress reviews will give the program a way to bring together all the information, fill in any gaps in coordination, and decide what actions to take. A midterm evaluation will look at how well the program is being carried out and what early results have been achieved. This will help make changes for the second half of the program. An end line evaluation will look at the overall results, what was learned, and suggestions for how to keep the program going after the project ends.

Indicators and measurement focus. The indicator set will include both operational and outcome-based measures for all parts of the program. Monitoring for visitor management will focus on the following: orientation coverage, compliance incidents, waste-related violations, completion of trail maintenance, and completeness of permit tracking. Governance indicators will keep track of the number and variety of consultations, the percentage of issues that were dealt with, how quickly complaints were resolved, and how consistent the outputs of transparency were. Capacity indicators will keep track of how many trained staff there are, how well patrols cover an area, how well equipment works, and how quickly incidents are responded to. Indicators of tourism's effects will look at how waste builds up at important sites, how erosion or habitat disturbance happens, how many people are visiting at once, and how visitors are spread out. Finally, indicators for zoning and enforcement will

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keep track of zoning violations that have been reported and fixed, actions taken on reports of illegal activity, and how much IP is involved in PAMB decisions to make sure that protection is both rule-consistent and rights-based.

The proposed intervention also requires an effective structure for its implementation. The structure proposed for this intervention is to have a strong governance structure with complementary roles within key institutions. The structure is to have the DENR/PASu as the technical lead responsible for the planning and day-to-day management of protection and enforcement, including the preparation of management reports compliant with the requirements of the ENIPAS structure. The Protected Area Management Board shall also oversee and guide the intervention with its direction and oversight function of setting priorities, support and coordination with multiple stakeholders, stakeholder engagement, and the approval of key protocols and site-level mechanisms such as visitor protocols, zoning, and enforcement. The Environmental Management Bureau shall also support this intervention with technical assistance for environmental tracking, development and refinement of impact indicators, and assistance in incorporating environmental into management and decision-making.

At the local level, the Local Government Unit (LGU) plays a crucial enabling role through assistance in local enforcement initiatives, improvement of waste management systems including relations with tourism-generated waste effects, and assistance in aligning local tourism regulation initiatives with local and park management priorities and needs. In these regards and in relation to enabling functions and assistance required, the National Commission of Indigenous Peoples (NCIP) and Indigenous Peoples (IP) structures enable rights-based and culture-linked management through providing relevant instructions on Indigenous peoples participation and assistance in processing and linking cultural consultations and participation as required and necessary in alignment with co-management functions as applicable and necessary as well. Lastly, the PNP and other law enforcement structures enable enforcement assistance and support through joint patrols and response assistance and actions as necessary in relation to responding against illegal activities as necessary and required particularly in instances wherein concerted law enforcement actions are required and necessary. These such offices collectively form a convergent and integrated management approach wherein technical management actions and functions, policy actions and guidance, as well as local and rights-supportive actions and enforcement capacity are integrated and utilized as a single mechanism in enhancing management actions and processes of Mt. Apo Natural Park.

Sustainability and Institutionalization Plan. The program will institutionalize outputs in the regular operation of the MANP to ensure the sustainability of the outputs after the project period through the following steps: (a) the formulation and adoption of SOPs via the issuance of PAMB Resolutions, (b) the inclusion of indicators within the regular DENR/EMB reports, (c) the undertaking of training cycles within the annual work plans, and (d) the formulation of inter-agency agreements for visitor flow, waste management, and joint enforcement

CONCLUSION

The results suggest that, in the case of Mt. Apo Natural Park, the management effectiveness that the stakeholders do not perceive is not something that can be regarded solely as a matter or a result, or simply an ecological result. It can be conceived, to a great extent, based on the conservation results that have a strong relationship with visitor management and the condition of the most important sites. Meanwhile, management effectiveness is related to participation, clarity, coordination, and conflict resolution.

Additionally, the study also makes it clear that protection activity is highly dependent on readiness on the ground. The activity of effective patrolling and monitoring is seen to be allied to adequate training, personnel, and equipment, although the impact of visitor pressure tends to exacerbate both threats to the ecosystem and workload. However, a lasting protection activity is allied to strict zoning, the suppression of illegal activities, and is reinforced by the appropriate decision-making structures that take into account the representation and rights of Indigenous Peoples.

In general, the five-factor framework is a scientific basis for enhancing the management of protected areas in the case of MANP that allows identifying the factors of management importance for the stakeholders and then establishing a framework for management intervention based on these results.

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RECOMMENDATION

First, the five-factor approach can be taken up by the DENR/PASu and the PAMB as a tool for management by planning and prioritization and monitoring of performance. Visitor management strategies can be improved by more effective permit and orientation regimens and regular trail and campsite upkeep, especially in areas prone to heavy visitation where the negative effects become amplified rapidly. Contemporarily, the need for effective site waste management and crowding controls to avert degradation from tourism even as the experiences of the visitors are not compromised.

Second, reforms in governance should target enhancement in terms of the transparency, participation, and coordination principles. The PAMB could formalize mechanisms for consultations that entail the integration of feedback, mechanisms for grievances and mediation that are strengthened, and delivery of key decisions through formats that are more accessible. Coordination among the DENR, LGU, NCIP, and law enforcement agencies could then be formalized through the collaborative protocol and common schedule for the implementation, particularly in enforcement and hotspot areas. The key should then continue to center on the enhancement of IP representation within decision-making arenas, not just for rights, but for the basis for compliance.

Finally, the recommendation is that the EMB and other partner institutions should support a result-based monitoring and evaluation approach via a set of indicators that are aligned to the five management domains. There could be future research endeavors put into the validation of the proposed framework by the confirmatory factor analysis approach or by comparing the groups or by aligning the domains and the ecological indicators and the monitoring data at the sites to enhance the relevance of the policy and the approach to the development of the study.

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