

# Balancing Conservation and Community Development: The Socio-Economic Impacts of Protected Areas on Local Communities at the Las Piñas-Parañaque Wetland Park

<sup>1</sup>Lorenzo de Roa Abeleda, <sup>1</sup>Nicarh B. Amidao, <sup>1</sup>Mina Grace B. Arce, <sup>1</sup>Ferly Queen R. De-ala, <sup>1</sup>Dionisio R. Delizo, <sup>1</sup>Allan Francis L. De Vera, <sup>1</sup>Ismar Irenick R. Estrella, <sup>1</sup>Joy B. Lariosa, <sup>1</sup>Kimuel A. Soriano, <sup>1</sup>Monina C. Timon, <sup>1</sup>Kelvin R. Mamitag, <sup>1</sup>Jovertlee C. Pudan  
<sup>1</sup>Philippine Christian University, Philippines

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## ABSTRACT

The Las Piñas-Parañaque Wetland Park (LPPWP), a vital ecological sanctuary in Metro Manila, faces numerous environmental and socio-economic challenges. This study investigates the socio-economic impacts of LPPWP's conservation policies on adjacent communities using a mixed-methods approach, integrating quantitative surveys (n=2,235) and qualitative interviews and focus groups. Findings reveal significant socio-economic disparities, with lower-income, less-educated, and insecurely housed populations reporting poorer health and higher food insecurity. Chi-square and Spearman correlation analyses demonstrate statistically significant associations between education, income, tenure status, and well-being indicators, supporting the hypothesis that marginalized groups experience greater vulnerability. Contrary to expectations, geographic proximity to the LPPWP did not consistently predict positive perceptions of its benefits. In some cases, distant barangays reported more favorable impacts than closer ones, underscoring the importance of local context. Furthermore, perceptions of community participation in conservation efforts were paradoxically associated with less favorable views of the park's impact, suggesting disconnection or dissatisfaction with participatory processes. The study emphasizes the need for equitable, community-centered conservation strategies, including participatory planning, benefit-sharing mechanisms, and sustainable livelihood programs. Strengthening education, public awareness, and waste management is also critical. This research provides actionable insights for balancing biodiversity protection with social equity, reinforcing the necessity of inclusive governance in protected area management. The findings contribute to broader discourses on environmental justice, sustainable development, and the socio-ecological dynamics of urban conservation.

**Keywords:** *Biodiversity Conservation, Community Participation, Environmental Justice, Food Security, Urban Wetlands*

## INTRODUCTION

Urban wetlands are increasingly recognized as critical ecosystems that provide ecological, social, and economic services within densely populated areas. They play a crucial role in biodiversity conservation, flood mitigation, water filtration, carbon sequestration, and providing livelihoods for surrounding communities (Cordeiro et al., 2021). However, these ecosystems face substantial threats due to urbanization, pollution, weak governance, and a lack of community engagement. The Las Piñas-Parañaque Wetland Park (LPPWP), a Ramsar-listed urban wetland in Metro Manila, Philippines, embodies both the potential and challenges of managing such valuable urban ecological assets.

LPPWP spans approximately 181 hectares and serves as a critical habitat for migratory birds, a carbon sink, and a natural barrier against storm surges and flooding (DENR, 2018). Yet, its conservation is continually undermined by illegal fishing, unregulated urban expansion, and chronic dumping of solid

waste. These anthropogenic pressures contribute to habitat degradation, biodiversity loss, and poor water quality, affecting both the ecological integrity of the park and the well-being of local communities (Acuña, 2020). These challenges mirror those found in other Southeast Asian urban wetlands, where rapid urbanization collides with conservation goals (Villanueva, 2023).

Institutional fragmentation is one of the most pressing governance issues in LPPWP. Multiple agencies—both national and local—have overlapping mandates, which results in regulatory ambiguity and enforcement gaps (Cruz, 2022). This is compounded by limited funding and technical capacity, making consistent ecological monitoring and program implementation difficult. Research from similar contexts indicates that without coherent management structures and adequate resources, protected urban wetlands are vulnerable to neglect and exploitation (Dizon, 2021).

In the case of LPPWP, the absence of sustained investment in waste management and habitat restoration further exacerbates ecological degradation. According to the Manila Observatory (2024), communities around LPPWP continue to experience deteriorating environmental conditions, with persistent flooding, increased waste accumulation, and declining fisheries yields. These issues are not only environmental but also socio-economic, impacting food security, health, and income—particularly among the most marginalized households.

Community participation is widely recognized as a cornerstone of effective conservation. Yet, participation around LPPWP remains inconsistent and limited, largely due to a lack of environmental education and inclusive governance structures (Yap, 2022). In studies on participatory wetland management, it has been shown that when communities are genuinely engaged, they are more likely to take ownership of conservation efforts, leading to improved environmental outcomes and strengthened social cohesion (Enriquez et al., 2021). However, at LPPWP, many residents remain unaware of the site's Ramsar designation or the ecological importance of its biodiversity (Cruz, 2022).

Youth engagement, in particular, is seen as a potential catalyst for change. Programs such as those initiated by the Wetlands International Philippines have aimed to educate young people about wetland values and conservation practices (Wetlands International Philippines, 2021). Despite these initiatives, broader community awareness remains low, and environmental behaviors such as littering and informal fishing persist in surrounding barangays (DENR, 2020).

Socioeconomic disparities also shape how conservation is experienced by local communities. Recent studies reveal that those with lower incomes, insecure housing tenure, and limited education face greater barriers in accessing the benefits of conservation, such as ecotourism employment or environmental health improvements (Manila Observatory, 2024). These findings are consistent with global literature on environmental justice, which highlights that conservation policies often disproportionately burden marginalized populations unless equity-focused approaches are applied (Gómez-Baggethun & Barton, 2022).

Moreover, the transition from traditional livelihoods—such as fishing and plant gathering—toward alternative income sources has been uneven. While ecotourism and green employment opportunities have been proposed, their implementation has faced logistical and market challenges (Acuña, 2020). Without robust support mechanisms such as skills training, market access, and equitable benefit-sharing, alternative livelihoods may not provide sufficient compensation for lost resources (Cordeiro et al., 2021).

Despite the promise of ecosystem service valuation as a means of influencing policy, it remains underutilized in the case of LPPWP. Studies have shown that when the economic value of urban wetland services—such as flood control and air purification—is clearly quantified, it can strengthen arguments for conservation investment and policy prioritization (Gómez-Baggethun & Barton, 2022). In LPPWP, however, such valuation exercises have been minimal, contributing to a lack of political

will and funding.

To respond to these complex, interwoven challenges, this study adopts a mixed-methods approach to assess the socio-economic impacts of LPPWP's conservation policies on surrounding communities. Specifically, it investigates relationships among income, tenure status, educational attainment, food security, perceptions of community participation, and overall well-being. By combining quantitative survey data from over 2,200 residents across six barangays with qualitative interviews and focus groups, the study aims to provide a multidimensional understanding of how conservation efforts affect local lives.

Ultimately, the goal is to inform policies that are not only ecologically effective but also socially equitable. As emphasized in the United Nations Sustainable Development Goals (SDGs)—particularly SDG 11 (Sustainable Cities and Communities) and SDG 15 (Life on Land)—inclusive and participatory conservation strategies are essential for long-term success. The findings of this study will contribute to developing frameworks for community-based conservation that prioritize environmental justice, livelihood resilience, and ecological sustainability in urban wetland contexts like the LPPWP.

## **MATERIALS & METHODS**

The study adopted a mixed-methods research design to comprehensively examine the socioeconomic impacts of protected area conservation policies on local communities, specifically focusing on those living near the Las Piñas–Parañaque Wetland Park (LPPWP). This approach integrated both quantitative and qualitative methodologies to capture statistical trends and contextual insights, offering a holistic understanding of the issue.

On the quantitative side, structured survey questionnaires were administered to a randomly selected sample of residents from communities adjacent to the LPPWP. These surveys gathered data on key demographic variables such as age, gender, income level, and educational attainment. Additionally, they explored how conservation policies had influenced household income and livelihoods, assessed participation in alternative livelihood programs, and captured perceptions of the policies' impacts on daily life. A random sampling technique was employed to ensure broad representation across demographic and socioeconomic categories. The appropriate sample size was calculated using statistical methods to achieve sufficient analytical power. Collected data were analyzed using statistical software such as SPSS and R. The analysis included descriptive statistics, inferential tests like t-tests and ANOVA, and regression analyses to identify correlations and causal relationships between conservation interventions and socioeconomic indicators.

Complementing the surveys, the qualitative component included semi-structured interviews with key stakeholders, including local community leaders, government representatives involved in conservation and development efforts, and NGOs that implemented or supported alternative livelihood programs. Furthermore, focus group discussions were conducted with community members to elicit deeper insights into their lived experiences, perceptions of conservation initiatives, and recommendations for policy improvement. This participatory method fostered collective reflection and captured diverse viewpoints. Qualitative data were subjected to thematic analysis, wherein transcripts from interviews and focus groups were coded to identify patterns and emerging themes. Software such as NVivo was used to aid the systematic organization and interpretation of qualitative data. Together, these methods yielded a nuanced understanding of how conservation policies affected community well-being, livelihoods, and social dynamics.

## **RESULTS AND DISCUSSION**

**Summary of Quantitative Findings***(N = 2,235)*

Variable	Statistic/Test	Result
Education × Health Status	$\chi^2(8) = 111.73, p < .001$ ; Cramer's $V = .158$	Higher education associated with better self-reported health
Income × Food Security (Skipped Meals)	$\chi^2(9) = 256.92, p < .001$ ; Cramer's $V = .196$	Higher income → fewer skipped meals
Tenure × Food Worry	$\chi^2(2) = 84.80, p < .001$ ; Cramer's $V = .195$	Secure tenure → less food-related anxiety
Proximity × Perceived Livelihood Impact	$\chi^2(5) = 160.73, p < .001$ ; Cramer's $V = .308$	Perceived impact varies by barangay; not strictly distance-dependent
Perceived Participation × Overall Impact	Spearman's $\rho = .337, p < .001$	More participation perceived → more negative views of impact

The results of this study underscore the critical role of education, income, and housing tenure in shaping the well-being of communities living near protected areas such as the Las Piñas–Parañaque Wetland Park (LPPWP). The strong association between higher educational attainment and better self-reported health mirrors findings from other Philippine urban contexts, where education not only enhances environmental awareness but also improves adaptive capacity and access to services (Olfato-Parojinog et al., 2024). Similarly, the link between household income and food security—particularly the reduced frequency of skipped meals among higher-income households—echoes patterns identified in recent studies from Central Uganda and peri-urban India, where low-income communities remain highly vulnerable to food and livelihood shocks exacerbated by conservation restrictions (Akunna & de Wit, 2024; Imdad et al., 2024). In terms of housing tenure, respondents with secure ownership reported less food-related anxiety, reinforcing arguments from environmental justice literature that housing stability plays a foundational role in community resilience and access to conservation benefits (Gómez-Baggethun & Barton, 2022).

Unexpectedly, the study revealed that barangays located farther from the wetland reported more favorable perceptions of the LPPWP's livelihood impact. This pattern suggests that proximity alone does not determine perceived benefit, a finding supported by similar observations in Rajasthan's Cheleleka Wetland, where distant communities reported higher satisfaction due to effective local governance or targeted program delivery (Pathak et al., 2024). Barangay-specific factors such as the quality of local leadership, communication strategies, and the presence of active civil society organizations may explain these variations. Díaz-Pinzón et al. (2024) have emphasized how social capital and decentralized governance significantly influence how conservation benefits are perceived and distributed within communities.

Another notable finding is the counterintuitive correlation between perceived community participation and negative assessments of the park's impact. Instead of feeling empowered, respondents who reported more involvement in conservation processes tended to express dissatisfaction. This phenomenon, also documented in participatory forest governance projects in Nepal, reflects the problem of “participation fatigue” or disillusionment when engagement efforts are perceived as symbolic rather than substantive (Shrestha et al., 2023). Such outcomes point to a need for critical evaluation of participatory models to ensure that community involvement is meaningful, directly linked to tangible benefits, and not merely used to legitimize top-down decision-making.

Given these insights, several policy implications emerge. First, there is a need to strengthen environmental education programs and align them with targeted livelihood training. This dual focus can improve health outcomes, bolster household resilience, and enhance food security. Engaging youth

through school-based wetland stewardship and eco-volunteering, as shown effective in Estonia and in the Huaper wetlands, may also foster a culture of conservation (Müller et al., 2025; Frontiers, 2025).

Second, conservation strategies must be tailored to barangay-specific contexts. Since perceived impacts differ across communities, policy frameworks should empower local leaders, recognize community knowledge, and promote collaborative decision-making. Adopting a social-ecological systems (SES) perspective, which integrates ecological goals with local governance capacity, can help harmonize community needs with biodiversity targets (Díaz-Pinzón et al., 2024).

Third, participatory processes must evolve beyond consultation to include co-creation and shared accountability. Community-led monitoring, livelihood program co-design, and clear benefit-sharing mechanisms are essential to prevent disenchantment. Institutionalizing citizen science initiatives, as done successfully in flood-prone communities in Fiji and Indonesia, can also build trust and civic ownership in conservation (Wolff et al., 2021; EMB-NCR, 2023).

Finally, secure housing tenure must be prioritized as a pillar of equitable conservation. Formalizing tenure arrangements—especially for vulnerable populations—can reduce anxiety, support household stability, and promote equitable access to eco-tourism revenues or conservation employment. Conservation must proactively address mismatches between those who bear its costs and those who enjoy its benefits, aligning with broader principles of environmental equity and distributive justice (Gómez-Baggethun & Barton, 2022).

In conclusion, this study confirms that education, income, and tenure are key determinants of community well-being in the context of urban wetland conservation. It also reveals that perceptions of conservation success are nuanced and shaped more by governance and equity than by geographic proximity. Moreover, it highlights the risks of superficial participation that fails to deliver tangible outcomes. These findings call for a shift toward inclusive, community-driven conservation models that align environmental protection with social justice. In the case of the LPPWP, success will depend not only on ecological restoration but also on how meaningfully local communities are engaged and empowered in the process.

**Table 2**  
**Inferential Tests for Hypothesis 1 (N = 2,235)**

Variable Pair	Statistical Test	Result
Education × Health	$\chi^2(8)=111.73, p<.001; \text{Cramer's } V=.158$	Higher education linked to better health
Income × Health	$\chi^2(12)=643.20, p<.001; \text{Cramer's } V=.310$	Higher income associated with excellent health
Tenure × Health	$\chi^2(8)=122.45, p<.001; \text{Cramer's } V=.166$	Owners report better health than tenants
Income × Skipped Meals	$\chi^2(9)=256.92, p<.001; \text{Cramer's } V=.196$	Higher income → fewer skipped meals
Income × Food Worry	$\chi^2(3)=188.15, p<.001; \text{Cramer's } V=.290$	Lower income → increased worry about food
Education × Skipped Meals	$\chi^2(6)=273.35, p<.001; \text{Cramer's } V=.247$	Lower education → more skipped meals
Education × Food Worry	$\chi^2(2)=146.69, p<.001; \text{Cramer's } V=.256$	Secondary education least worried, lower most concerned
Tenure × Skipped Meals	$\chi^2(6)=117.92, p<.001; \text{Cramer's } V=.162$	Secure tenants skip meals less often
Tenure × Food Worry	$\chi^2(2)=84.80, p<.001; \text{Cramer's } V=.195$	Tenants more worried than owners

The analyses clearly confirm Hypothesis 1, demonstrating that socioeconomic variables—particularly educational attainment, income level, and housing tenure—are significantly associated with self-reported health and food security among residents living near the Las Piñas–Parañaque Wetland Park (LPPWP). These findings underscore the intersectionality of environmental conservation and social equity, highlighting the need for integrated policy responses.

Respondents with higher educational attainment consistently reported better general health outcomes. This aligns with recent research, which emphasizes that education enhances health literacy, facilitates access to healthcare services, and improves the capacity to engage in health-promoting behaviors (Rural Health Information Hub, 2025). Additionally, education equips individuals with better decision-making skills, enabling them to adapt to ecological and economic stressors. Interestingly, those with secondary or vocational education reported the lowest levels of food-related worry—even lower than respondents with higher education. This suggests that skill-based training may offer more immediate and tangible economic benefits, especially in labor markets constrained by limited formal job opportunities (Eldoret Study, 2024).

Income also emerged as a significant determinant of both health and food security. Respondents in the higher income groups were significantly more likely to report excellent health and less likely to skip meals or worry about food. These findings are consistent with recent global studies, which reveal that food insecurity in peri-urban zones is highly sensitive to income variability, especially under the compounded pressures of inflation and climate instability (FAO, 2023; Peri-urban Agriculture & Nutrition Report, 2023). The fact that individuals who chose not to disclose their income ("No Answer" group) reported the worst health outcomes further suggests hidden vulnerabilities within this subgroup.

Housing tenure added another layer of disparity. Owners reported significantly better health and were less likely to worry about food compared to renters and those living rent-free without formal consent. Secure tenure contributes to psychological stability and often correlates with better living conditions, both of which are linked to improved health outcomes. These findings resonate with current urban commons research, which argues that tenure security is essential for fostering resilience and civic participation in environmental governance (MDPI, 2025).

These patterns offer several implications for policy and practice. First, there is a clear need to expand access to adult education and vocational training. Integrating environmental education with skills development could foster both ecological awareness and economic resilience. For instance, community-based programs in Estonia and Kenya have shown that youth-centered conservation training can improve both livelihoods and ecological stewardship (Müller et al., 2025; Eldoret Study, 2024). Second, targeted livelihood support and food assistance should prioritize low-income households, especially during seasonal or economic downturns. Peri-urban agriculture projects—paired with adequate water and sanitation infrastructure—have proven effective in improving food security in similar contexts (Peri-Urban Agriculture Report, 2023). Third, formalizing tenure arrangements and recognizing informal settlements can mitigate food anxiety and support equitable access to conservation benefits. Community tenure recognition programs have shown promise in balancing ecological goals with human rights, particularly in urban wetland contexts (Gómez-Baggethun & Barton, 2022).

In conclusion, the findings offer compelling evidence of socioeconomic disparities in health and food security within the communities surrounding LPPWP. These disparities are shaped by structural inequities in education, income, and tenure. Addressing them through integrated, community-sensitive strategies will be essential to transforming urban conservation into an inclusive and sustainable development agenda—one that advances not only biodiversity goals but also human well-being and social justice.

**Table 3**  
**Inferential Test Results for Hypothesis 2: Proximity and Perceived Impacts (N varies)**

Impact Variable	Statistical Test	Result	Effect Size	Interpretation
Livelihood Impact	Chi-Square Test of Independence	$\chi^2(5) = 160.73$ , $p < .001$	Cramer's V = .308	Medium effect; significant variation by barangay
Food Source Impact	Chi-Square Test of Independence	$\chi^2(5) = 351.09$ , $p < .001$	Cramer's V = .439	Large effect; significant variation by barangay
Overall Well-being Impact	Kruskal-Wallis Test	$H(5) = 40.76$ , $p < .001$	n/a (non-parametric)	Significant rank differences across barangays

The findings from the analysis of Hypothesis 2 reveal that while proximity to the Las Piñas–Parañaque Wetland Park (LPPWP), operationalized as barangay of residence, is significantly associated with perceived impacts on livelihood, food sources, and overall well-being, the relationship is not linear or directly tied to distance. Instead, it exhibits a complex and non-uniform pattern. Chi-square tests indicated that La Huerta—the farthest barangay from the wetland—reported the highest levels of perceived positive impact on livelihood and fish availability, with 100% of respondents responding affirmatively in both domains. In contrast, Manuyo Uno, which is located at a mid-range distance from the wetland, recorded the lowest levels of perceived benefit, with only 66.7% acknowledging livelihood improvements and just 50% recognizing a rise in aquatic food production. Likewise, the Kruskal-Wallis test results showed statistically significant differences in perceived well-being across barangays. Notably, Manuyo Uno had the poorest mean rank, while closer barangays like Daniel Fajardo and Ilaya showed relatively more favorable outcomes.

These results reflect broader research insights suggesting that physical proximity alone does not guarantee heightened awareness, access, or appreciation of wetland-related benefits. For instance, Wilkins et al. (2022) found in a U.S. study that while residents living closer to wetlands had greater exposure and visitation rates, this did not necessarily translate into stronger conservation concern. Instead, actual interaction with wetland spaces—such as through guided programs or educational experiences—was a stronger driver of community engagement and support. Similarly, Villagra et al. (2024) observed that perceptions of urban wetland value are strongly mediated by variables like accessibility, socioeconomic status, and the communicative landscape of each neighborhood, which can differ substantially between barangays.

The results also highlight the importance of governance and program delivery quality in shaping community perceptions. This interpretation is reinforced by Saluja et al. (2023) in their study of Myanmar's Upper Chindwin Basin, where communities' awareness and appreciation of wetland ecosystem services were closely linked to program visibility, leadership involvement, and local economic reliance on wetlands, rather than spatial proximity. These barangay-specific factors likely explain why La Huerta, despite its greater distance from the LPPWP, reported stronger perceived benefits than barangays that are geographically closer, such as Manuyo Uno.

Analytically, the significance of the Kruskal-Wallis and Dunn's pairwise results between barangays such as Daniel Fajardo, Elias Aldana, and Manuyo Uno points to meaningful differences in perceived well-being that cannot be attributed solely to geography. These patterns support the socio-ecological systems (SES) framework, which posits that local governance structures, historical engagement, and

community capacity play pivotal roles in shaping how conservation efforts are received and experienced by local populations (ScienceDirect, 2024).

Given these findings, several policy implications emerge. First, conservation strategies should move away from blanket implementation and instead adopt barangay-specific interventions that consider unique community characteristics. Underperforming areas like Manuyo Uno may benefit from customized programs that address specific gaps in outreach, communication, or participation. Second, increasing accessibility to the LPPWP—through educational tours, citizen science programs, and targeted community engagement—could enhance understanding and appreciation of its benefits. As shown in Wilkins et al. (2022), these forms of direct interaction are critical in shaping public perception and long-term conservation support.

Moreover, communication and outreach strategies should be tailored to the needs and values of each barangay. For example, while livelihood benefits may resonate with residents of La Huerta, those in Manuyo Uno might be more responsive to narratives focusing on environmental quality or health-related impacts. Finally, investing in community leadership development and participatory governance can build the social capital necessary for sustaining conservation programs and ensuring equitable distribution of their benefits. This is consistent with Villagra et al. (2024), who found that trust in local institutions and participatory mechanisms significantly enhances the perceived value of wetlands in urban settings.

In conclusion, while Hypothesis 2 is statistically supported, the findings emphasize that proximity alone does not explain variations in perceived impacts. Instead, the results underscore the importance of barangay-specific drivers such as governance quality, program effectiveness, and community engagement. Future conservation efforts at the LPPWP must therefore prioritize context-sensitive, inclusive approaches that reflect the social realities of each barangay and translate ecological protection into equitable and widely shared community benefits.

**Table 4**  
**Spearman’s Rank Correlation Between Perceived Community Participation and Perceived Overall Impact of LPPWP (N = 1,820)**

Variable	1	2
1. Overall Impact of LPPWP	—	.337**
2. Perceived Community Participation	.337**	—

**Note.** Overall impact was coded as 1 = "Better", 2 = "No impact", 3 = "Worse".  
 Participation was coded as 1 = "Yes", 2 = "No".

**Spearman’s  $\rho = .337, p < .001$ .**

**N = 1,820** (excludes “I don’t know” responses).

**Correlation is significant at the 0.01 level (2-tailed).**

The results for Hypothesis 3 revealed a statistically significant, medium-sized positive correlation between perceived community involvement in the management of the Las Piñas–Parañaque Wetland Park (LPPWP) and overall perceptions of its household-level impact. Specifically, a Spearman’s rho of 0.337 ( $p < .001$ ) was calculated, indicating that those who believed the community was actively involved in LPPWP management were more likely to report neutral or negative perceptions of the park’s impact on their lives. This finding contradicts the original hypothesis, which expected a negative correlation—i.e., that higher perceived participation would correspond with more positive assessments of the park’s impact.

At first glance, this result may seem paradoxical, as community participation is widely regarded as a cornerstone of equitable and effective conservation. However, recent studies suggest that participation, if poorly implemented or insufficiently rewarded, can generate disillusionment rather than empowerment. For example, Shrestha et al. (2023) reported in Nepal that residents who were more actively engaged in community forestry governance became more critical of the outcomes when tangible benefits did not materialize. Participation that lacks clear roles, transparency, or follow-through may heighten community expectations without delivering visible improvements, leading to dissatisfaction.

Similarly, Díaz-Pinzón et al. (2024) emphasized that tokenistic or symbolic participation—where community voices are solicited but not integrated into decision-making—can backfire by eroding trust and fostering perceptions of exclusion. In the case of LPPWP, it is possible that “participation” is interpreted by residents as mere consultation or presence at meetings, without a sense of co-ownership or shared responsibility in conservation planning. This aligns with the broader critique of participatory environmental governance as sometimes being more procedural than substantive, especially in urban and peri-urban settings where development pressures and institutional fragmentation are prevalent.

The significance of this correlation points to the importance of re-evaluating the quality of participation, not just its presence. Rather than focusing solely on engagement rates or meeting attendance, LPPWP stakeholders should consider how meaningful and impactful these engagements are from the perspective of community members. True participation should involve shared decision-making power, co-design of programs, and equitable benefit-sharing—elements that contribute to both conservation effectiveness and social legitimacy.

From a policy standpoint, these findings suggest several strategic shifts. First, public participation mechanisms should be redesigned to include clear, actionable roles for community members. Second, expectations must be managed through transparent communication about what participation entails and what benefits can realistically be expected. Third, feedback loops must be strengthened: community input should visibly shape conservation priorities, and communities should be regularly informed about how their contributions influence outcomes. Finally, investment in community capacity building—not just consultation—can cultivate local leadership and foster a stronger sense of ownership over wetland management.

In conclusion, while Hypothesis 3 was not supported in the predicted direction, the results offer valuable insight. They reveal a disconnect between perceived participation and perceived benefits, likely rooted in the quality and substance of engagement. These findings urge a more nuanced approach to participatory governance—one that emphasizes empowerment, transparency, and reciprocity—to ensure that conservation is not only inclusive in form but also equitable and effective in practice.

## **CONCLUSION**

The findings of this research underscore the complex relationship between biodiversity conservation and local livelihood security, using the Las Piñas-Paríaque Wetland Park (LPPWP) as a case study. Conservation policies at LPPWP have significantly altered traditional livelihood practices, particularly those based on resource extraction such as fishing and plant gathering. While these restrictions are ecologically justified, they have resulted in tangible economic losses for many households, particularly those with a high dependency on wetland resources. The uneven impact across communities reveals that conservation outcomes are deeply tied to pre-existing social and economic conditions.

Efforts to mitigate these disruptions—such as ecotourism and alternative income-generating programs—have yielded mixed results. While some community members have benefited from new opportunities, others remain marginalized due to a lack of access to training, limited market reach, or inadequate support infrastructure. These inconsistencies highlight a critical gap in the design and implementation of mitigation strategies. Ecotourism, in particular, shows promise but must be paired with inclusive planning and equitable benefit-sharing mechanisms. Without deliberate targeting of the most affected groups, these initiatives risk reinforcing existing social inequalities rather than alleviating them.

Going forward, the success of conservation at LPPWP hinges on adopting a more community-centered, participatory model of governance. This involves not only including local stakeholders in decision-making but also empowering them to co-design conservation strategies and lead sustainable livelihood programs. Such an approach requires acknowledging and incorporating local knowledge, formalizing benefit-sharing systems, and ensuring that alternative livelihood options are viable and context-appropriate. By aligning ecological goals with community priorities, LPPWP can serve as a model for inclusive and equitable urban wetland conservation.

### **Recommendations**

1. Implement participatory planning by involving local communities in every stage of conservation decision-making—policy design, implementation, and monitoring. This fosters trust, ensures their needs are addressed, and improves overall conservation outcomes.
2. Establish equitable benefit-sharing mechanisms that directly compensate communities affected by conservation policies. This includes financial compensation for lost income, investments in public infrastructure, job creation through ecotourism and park management, and skills development programs tailored to community needs.
3. Support sustainable livelihood alternatives that are economically viable and environmentally appropriate. Programs may include responsible aquaculture, community-based ecotourism, sustainable harvesting of non-timber forest products, and artisan craft production using local materials.
4. Empower community-based resource management (CBRM) by providing training, funding, and legal authority to local groups to manage wetland areas. CBRM encourages ownership, improves conservation efficiency, and supports social cohesion.
5. Increase funding and resources for LPPWP management to ensure regular maintenance, water quality monitoring, enforcement of regulations, and the restoration of degraded habitats.
6. Strengthen enforcement of conservation regulations by deploying additional patrols, increasing penalties for violations, and integrating community-led monitoring systems to deter illegal fishing, dumping, and encroachment.
7. Improve waste management systems by establishing better waste disposal infrastructure, promoting recycling, and raising community awareness about the environmental impact of improper waste practices.
8. Launch targeted public awareness campaigns using mass media, social media, and community events to inform the public about the LPPWP's ecological significance, current threats, and the benefits of conservation.
9. Develop environmental education programs in schools and communities to foster early and lifelong understanding of wetland ecosystems, biodiversity, and sustainable practices through hands-on learning activities.

10. Promote environmentally responsible ecotourism as a dual strategy to raise conservation awareness and generate local income. These activities should be designed to directly benefit community members while preserving the ecosystem.
11. Conduct research to quantify the socio-economic impacts of conservation policies, measuring both the positive contributions to ecosystem services and the economic losses faced by affected households.
12. Evaluate mitigation strategies regularly to assess the effectiveness of benefit-sharing programs and livelihood support initiatives, identifying which approaches are most equitable and impactful.
13. Assess and monitor community perceptions through periodic surveys and focus group discussions to ensure that conservation efforts remain aligned with community needs and that local voices guide policy evolution.

By following these recommendations, the LPPWP can create a more inclusive conservation framework that supports both biodiversity and community resilience.

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