

SOCIAL DIMENSIONS OF FISHERIES CO-MANAGEMENT AND ENGAGEMENT OF FISHERFOLK COMMUNITY IN RIZAL PROVINCE

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ABSTRACT:

Fisheries co-management has long been promoted as a participatory approach to sustainable resource governance. Yet, questions remain about the extent to which fisherfolk meaningfully engage in conservation and livelihood development. In the context of the Philippines, particularly in the coastal municipalities of Rizal Province along Laguna de Bay, this study examined how the social dimensions of co-management—participation, power, and equity—influence the engagement of fisherfolk communities in native fish conservation and sustainable fisheries ventures. Adopting a sequential exploratory mixed-methods design, the study first explored fisherfolk's experiences through interviews with MFARMC officers from nine municipalities. Thematic analysis was conducted to identify key roles and engagement patterns. A structured survey was conducted to quantify perceptions of the social dimensions and their relationship to conservation and livelihood engagement. Data were analyzed using descriptive statistics, correlation, and multiple regression. The findings revealed that while participation and power are present in local co-management structures, equity emerged as the most significant predictor of fisherfolk engagement in both conservation and fisheries ventures. Fisherfolk are more likely to participate meaningfully when they perceive fairness in access to resources, representation, and benefit sharing. The study concludes that for co-management to be effective and inclusive, equity must be operationalized not only in policy but also in practice. This highlights the need for governance strategies that go beyond structural inclusion to foster substantive, equitable engagement.

Keywords: fisheries co-management, participation, power, equity, fisherfolk engagement, native fish conservation, sustainable fisheries ventures, mixed-methods, Rizal Province Abbreviations: MFARMC, Municipal Fisheries and Aquatic Resource Management Council FARMC, Fisheries and Aquatic Resource Management Council

INTRODUCTION:

Fisheries co-management has emerged as a globally recognized framework that promotes shared governance between state authorities and local resource users. In the context of small-scale fisheries, particularly in developing countries like the Philippines, this approach has gained momentum for its potential to democratize decision-making and promote ecological sustainability [1]. Although the co-management framework is theoretically supported by policy instruments such as the Philippine Fisheries Code (RA 8550) and the establishment of Fisheries and Aquatic Resources Management Councils (FARMCs), these institutional structures do not automatically translate into meaningful inclusion. Existing studies affirm the transformative promise of co-management [1], [2], [3], but empirical evidence remains limited regarding how social dimensions—specifically participation, power, and equity—are perceived, practiced, and experienced within these governance arrangements. Despite decades of policy support, however, the realities on the ground reveal persistent tensions and disparities in the actual implementation of co-management practices.

This study addresses this gap by examining the experiences of fisherfolk communities in nine coastal municipalities in Rizal Province, which surrounds Laguna de Bay. These communities represent microcosms of the broader co-management landscape and serve as critical test beds for understanding how participatory governance unfolds in practice. Central to this inquiry are three social dimensions—participation, power, and equity—that influence fisherfolk engagement in native fish conservation and sustainable fisheries ventures.

Participation, as examined in this study, concerns the extent to which fisherfolk attend community meetings, contribute to local planning, and engage in implementation processes. This is not merely about presence but about influence—about whether fisherfolk are heard and whether their contributions shape policy outcomes [4]. Power, meanwhile, refers to the leadership roles and authority exercised by fisherfolk within governance bodies like MFARMCs. Prior literature has highlighted the symbolic nature of power-sharing, where formal roles may not equate to real influence [5], [6].

Equity, the third variable, involves fairness in access to opportunities, resources, and benefits derived from fisheries programs and policies. It encompasses both procedural and distributive justice, reflecting whether fisherfolk—particularly marginalized groups—perceive and experience governance as inclusive and fair [7], [8], [9]. Studies such as those by Fabinyi et al. [10] emphasize that inequities in governance undermine fisherfolk engagement and compromise co-management legitimacy.

Thematically, these variables represent interdependent elements of governance. Participation manifests through community presence in planning and policy discussions. Power is negotiated through authority and leadership roles within co-management bodies. Equity is perceived through fair access, legal entitlement, and inclusion in benefit sharing. Yet, fisherfolk often encounter symbolic rather than substantive inclusion, leading to disenchantment and disengagement.

This study is anchored on the theoretical contributions of Selin and Chavez [11], who emphasized collaborative processes in environmental governance; Pomeroy and Berkes [1], who illustrated varied forms of power-sharing in fisheries; and Plummer and FitzGibbon [6], who identified multidimensional attributes of co-management. These scholars argue that co-management is more than an institutional form—it is a dynamic process of social negotiation. Thus, this research is driven by the intention to assess how participation, power, and equity function in real-world settings and how they influence fisherfolk engagement in two focal areas: native fish conservation and sustainable fisheries ventures. Specifically, the study seeks to: 1) explore fisherfolk roles as framed by these social dimensions; 2) describe their engagement in conservation and livelihood efforts; and 3) analyze the predictive influence of participation, power, and equity on engagement outcomes.

This research contributes localized, empirical insights to the discourse on participatory resource governance. It challenges assumptions that structural inclusion alone suffices for engagement and emphasizes that co-management success is contingent upon how well participation, power, and equity are enacted and experienced by fisherfolk communities it intends to serve.

METHODOLOGY:

This study employed a Sequential Exploratory Mixed-Methods Research Design to gain both depth and breadth in understanding the social dimensions of fisheries co-management—specifically participation, power, and equity—and their influence on fisherfolk engagement in Rizal Province. This approach is particularly well-suited when the phenomenon under study is not well understood or lacks detailed conceptualization from the participants' perspectives. The exploratory phase is qualitative in nature, followed by a quantitative phase that builds on the qualitative findings. In the first phase, qualitative data were gathered through in-depth, semi-structured interviews with MFARMC officials from nine coastal municipalities surrounding Laguna de Bay. This phase aimed to explore the lived experiences, perceptions, and institutional roles of fisherfolk in the co-management system. Thematic analysis, guided by Braun

and Clarke's six-phase framework, was used to identify recurring themes related to participation, power, equity, and community engagement. These themes provided the foundation for the next phase.

The second phase involved the development and administration of a structured survey instrument, based directly on the emergent qualitative themes. This quantitative phase adopted a descriptive, cross-sectional design, involving 90 fisherfolk respondents. The instrument used 5-point Likert scale items to measure perceptions of participation, power, equity, and engagement in both native fish conservation and fisheries ventures. Statistical analyses included descriptive statistics, Pearson correlation, and multiple regression to identify predictive relationships.

The sequential design allowed the researchers to build theory from the ground up, capturing context-rich narratives before quantifying the patterns observed. Integration of the two phases occurred during interpretation, wherein the qualitative insights were used to explain the statistical findings and to provide deeper meaning to observed trends. This design ensured that the survey instrument was not only empirically grounded but also culturally and contextually relevant, enhancing both validity and reliability.

Ethical considerations were strictly observed throughout the research process. Participants provided informed consent, and confidentiality was assured. The study also followed the criteria for trustworthiness in qualitative research—credibility, transferability, dependability, and confirmability—through triangulation, prolonged engagement, and participant validation during the interpretation phase.

RESULTS:

The findings of this study are presented in two phases aligned with the Sequential Exploratory Mixed-Methods Research Design. Phase 1 focuses on qualitative insights derived from thematic analysis, while Phase 2 presents statistical outcomes from the survey responses.

Phase 1 – Qualitative Findings

Thematic analysis yielded five salient themes: Participation, Power-Sharing, Equity, Engagement in Native Fish Conservation, and Engagement in Fisheries Ventures. Under the theme of *Participation*, fisherfolk emphasized their active involvement in community activities and policy meetings, often citing monthly MFARMC gatherings as vital avenues for engagement. The category of *Community Program Involvement* revealed that fisherfolk commonly view meeting attendance as a form of meaningful participation.

The theme of *Power-Sharing* was split into two categories: MFARMC Leadership and Government and NGO Support. While many informants held leadership positions, their statements indicated that influence over policy was not always proportional to their roles. Thematic codes pointed to a perceived gap between formal positions and decision-making authority. Additionally, several respondents mentioned receiving aid and resources from BFAR and LGUs, but noted that these interventions were not always equitably distributed.

Equity emerged as a critical theme, reflecting on fairness in representation, legal entitlements, and access to benefits. Informants highlighted the legal basis for their participation in co-management (RA 10854) but expressed concern that not all sectors of the community benefit equally from support programs.

In terms of *Engagement in Native Fish Conservation*, responses were largely tied to compliance with local ordinances such as the *Batas ng Lawa*. While many participants reported awareness of ecological policies, only a few were actively involved in initiatives beyond regulatory compliance. Finally, the theme of *Engagement in Fisheries Ventures* revealed that fisherfolk were diversifying their livelihoods through aquaculture practices like fish cages, gillnets, and baklads, demonstrating adaptive resilience to economic pressures.

Phase 2 – Quantitative Findings

Table 1 presents the descriptive statistical analysis of research variables. Results showed that Participation recorded the highest mean ($M = 4.08$, $SD = 0.63$), suggesting that fisherfolk perceive themselves as regularly engaged in governance-related activities. This was followed closely by Equity ($M = 3.93$, $SD = 0.66$), and Power ($M = 3.89$, $SD = 0.67$), which had the lowest perceived score among the three social dimensions. For outcome variables, Engagement in Fisheries Ventures reported the highest mean ($M = 4.82$, $SD = 0.89$), while Engagement in Native Fish Conservation registered a slightly lower score ($M = 3.99$, $SD = 0.81$), indicating that economic engagement remains a primary concern for fisherfolk.

Table 1. Descriptive Statistical Analysis of the Research Variables

Variable	Mean	Standard Deviation
Power	3.89	0.67
Participation	4.08	0.63
Equity	3.93	0.66
Fish Conservation Engagement	3.99	0.81

Fisheries Ventures Engagement	4.82	0.89
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Table 2 presents the Pearson correlation results which further emphasized the centrality of Equity. Strong positive correlations were found between equity and both conservation engagement ($r = 0.748^{**}$) and fisheries ventures engagement ($r = 0.765^{**}$), supporting the assertion that perceived fairness and access influence participation in both ecological and economic domains. Participation was moderately correlated with both outcomes, while power had weak and non-significant correlations.

Table 2. Correlation Analysis of the Research Variables

Variable	1	2	3	4	5
1 Power	1				
2 Participation	0.423**	1			
3 Equity	0.165	0.270**	1		
4 Fish Conservation	0.196	0.282**	0.748**	1	
5 Fisheries Ventures	0.119	0.209**	0.765**	0.710	1

Table 3 presents the regression analyses confirmed the observed relationships. When predicting Engagement in Native Fish Conservation, the regression model explained 88% of the variance ($R^2 = 0.880$), with Equity emerging as the sole significant predictor ($\beta = 0.723$, $p < 0.001$). Neither Participation ($\beta = 0.065$, $p = 0.416$) nor Power ($\beta = 0.049$, $p = 0.533$) significantly predicted conservation engagement.

Similarly, in predicting Engagement in Fisheries Ventures, Equity was again the only significant predictor ($\beta = 0.765$, $p < 0.001$). Both Participation ($\beta = 0.006$, $p = 0.935$) and Power ($\beta = -0.011$, $p = 0.890$) failed to reach statistical significance. These results highlight that perceptions of fairness in benefit distribution, access, and representation—rather than structural involvement—play the most critical role in driving fisherfolk engagement in co-management outcomes.

Table 3. Regression Analysis of the Research Variables

Dependent Variable	Predictor	B	β	p-value
Fish Conservation	Power	0.059	0.049	0.533
	Participation	0.084	0.065	0.416
	Equity	0.893	0.723	0.000
Fisheries Ventures	Power	-0.014	-0.011	0.890
	Participation	0.009	0.006	0.935
	Equity	1.039	0.765	0.000

DISCUSSION:

The findings of this study underscore the central role of equity in shaping fisherfolk engagement within fisheries co-management structures. While participation and power are widely recognized in theoretical models, the empirical data presented here confirm that equity—defined by fair access to resources, representation, and benefit sharing—is the most influential factor driving involvement in both conservation and fisheries ventures. This aligns with the findings of Turner et al. [8].

The weak statistical influence of power in predicting engagement may be explained by its symbolic rather than substantive character in many co-management contexts. Jentoft [7] posits that power is often delegated in form but not in function, and this appears consistent with the qualitative narratives shared by MFARMC leaders in this study. Participation, though structurally encouraged, also showed limited predictive power in the regression models. This complicates assumptions in participatory governance literature, which often equate presence with influence. Arnstein's ladder of citizen participation [4] and the review by Puente-Rodríguez [12] are relevant here.

The consistency of equity as a predictor across both engagement dimensions suggests that efforts to improve co-management outcomes must prioritize distributive and procedural justice. Studies by Klein et al. [9] and Fabinyi et al. [10] support this, noting that unjust governance systems often fail to foster sustained community involvement.

Policy implications are clear, structures like Fisheries and Aquatic Resources Management Councils (FARMCs) must not only invite participation but institutionalize equity through transparent practices and inclusive leadership. Programs linking conservation with livelihood, such as aquaculture or ecotourism, can also enhance engagement and sustainability.

This study affirms the multidimensional model of co-management proposed by Plummer and FitzGibbon [6]. However, it extends the theory by demonstrating that equity often outweighs other social dimensions in driving actual behavioral outcomes in local governance systems.

The stronger predictive role of equity in both conservation and livelihood engagement reflects a broader pattern in community-based resource management. Legitimacy and fairness are essential conditions for sustained participation. This exemplifies access—understood as the ability to benefit from resources—is mediated by power and social structure.

Interestingly, the descriptive data suggest high levels of reported participation, yet this did not translate into predictive strength. This may suggest tokenistic inclusion—where participation occurs without corresponding influence. Cooke and Kothari caution against assuming presence equals empowerment.

The findings also reveal a gap between formal leadership roles and functional authority. Many fisherfolk serve in Municipal Fisheries and Aquatic Resources Management Councils (MFARMCs) but feel constrained by political hierarchies. This calls for leadership training and institutional support to elevate fisherfolk voices in policy discourse. Thematic narratives enriched the statistical data by contextualizing fisherfolk perspectives. Compliance with 'Batas ng Lawa' indicates conservation awareness but limited deeper ecological engagement. Similarly, while aquaculture was active, it was weakly tied to formal policy links, indicating a potential knowledge gap.

Overall, the findings reaffirm the interdependence of the social dimensions of co-management. Equity not only predicts engagement but reinforces perceptions of legitimacy and justice. Future governance models must incorporate dynamic feedback between lived experience and structural inclusion.

The implications of this study extend across multiple disciplinary dimensions, reinforcing the significance of fisheries co-management as a model for sustainable development. From an engineering perspective, the research emphasizes sustainable resource management through the conservation of native fish species in Laguna de Bay. Given the critical role of fisheries in supporting both food security and the local economy in the Philippines, the co-management approach contributes to infrastructure development by promoting balanced and long-term ecological use of aquatic resources.

In the realm of the social sciences, the study foregrounds participation, power-sharing, and equity as fundamental to effective governance. These social dimensions demonstrate that community engagement, fairness in representation, and inclusive decision-making are essential to the success of infrastructure and environmental policies. By embedding these principles, development programs are more likely to secure public trust and support.

From the educational standpoint, the findings underscore the importance of capacity-building through community education. Enhancing fisherfolk awareness and leadership through targeted training enables meaningful participation in governance and contributes to the long-term resilience of co-management systems. Education becomes a tool not just for information sharing but for empowerment.

The study also offers innovative governance insights by applying a sequential exploratory mixed-methods design. This methodological approach provides adaptive, context-specific solutions by integrating qualitative narratives with statistical validation. More importantly, the shift from top-down management to a more collaborative, equity-driven structure reflects a transformative approach to policy design.

Finally, the research highlights the importance of interdisciplinary integration. By bridging environmental governance, education, innovation, and social equity, the study presents a comprehensive framework for addressing sustainability challenges. This underscores the need for collaborative, cross-sectoral strategies to develop infrastructure solutions that are effective, equitable, and context-sensitive.

CONCLUSION:

This study concludes that equity is the most influential social dimension driving fisherfolk engagement in native fish conservation and fisheries ventures. While participation and power contribute to structural inclusion, they are insufficient without perceived fairness and tangible benefits. Effective co-management must integrate distributive and procedural justice into governance systems.

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