

# **Guardians of the sea: Perceptions of Marine Protected Areas by fishers; lessons learned from the Philippines**

## **Percepciones de los Pescadores sobre las áreas marinas protegidas, lecciones aprendidas en las Filipinas**

## **Les gardiens de la mer: Les perceptions des pêcheur sur les aires marines protégées, les leçons apprises aux Philippines**

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### **EXTENDED ABSTRACT**

Nearly 50% of all marine fish capture in the Philippines is from artisanal fisheries, most of which is un- or under-reported. As in many emerging nations around the world, the Philippines cannot fully address overfishing by managing only the 50% of catch that comes from commercial fisheries. In previous studies, community-managed marine protected areas (MPAs) in the Philippines indicated success in increasing fish abundance and biodiversity in some sites, though not all sites had the same results (Marriott et al. 2021). Using a large database of dependent and independent fisheries from Rare, an international non-governmental organization, and qualitative interviews we researched how social and ecological systems are connected within the small-scale fisheries in the Philippines. Specifically, we aimed to discover differences between villages in the Philippines that could be related to differences in biological outcomes.

While marine protected areas focus on providing refuge to the, generally adult, fish that live in the reef ecosystems, only approximately 10% of the MPAs in the Philippines are effectively managed (Campos and Aliño 2008). Enforcement and compliance of MPAs are difficult to enumerate but without both, fisheries cannot fully benefit from their protections. We used semi-structured interviews to assess the differences in perceptions of MPA compliance and enforcement among fishers at four ecologically 'successful' (Ayungon and Manjuyod) and 'unsuccessful' sites (Bindoy and Tayasan) in the Philippines. Participants were asked 10 questions to describe their perceptions on the MPA, if they had ever witnessed violations, if they thought people complied with the rules, and what challenges exists for fisheries management within the community. The interviews were conducted in English with assistance of a translator. The interviews were analyzed using thematic analysis, which breaks down the responses into themes.

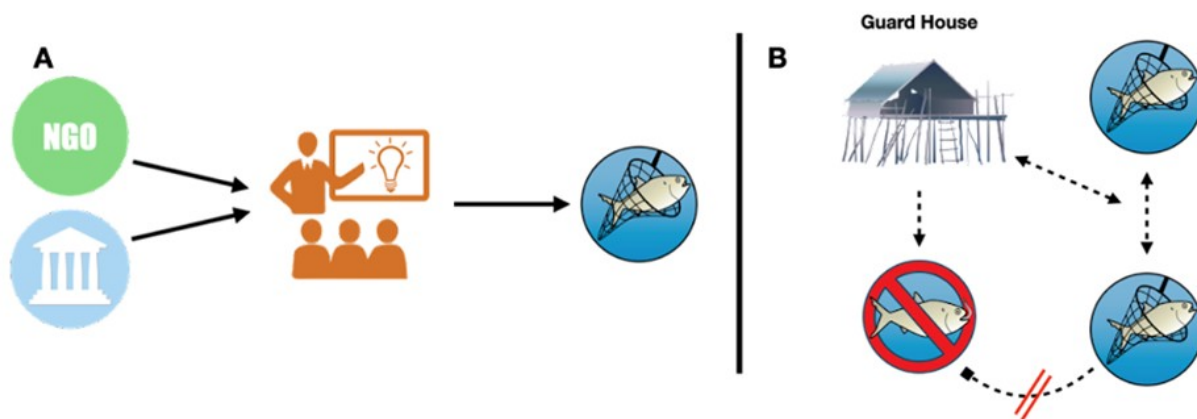
A variety of themes emerged from the interviews. In all sites, there was a perception that compliance of local fishers is high and that many challenges to fisheries management are from external sources, such as pollution, illegal fishers, or political corruption. Respondants also felt that marine reserves were helpful for fish and fisheries, citing that spillover occurred and the reserves provide spawning habitat for fished species. The most surprising difference was the perception of knowledge and education between successful and unsuccessful community-based managed sites. In the successful sites, respondents perceived there to be sufficient knowledge about the MPAs due to education campaigns and perceived compliance as being high due to them. One fisher said, "In the beginning it was hard to implement the rules, but we continue and continue to educate other fisherman, to help protect and monitor the sanctuary." In the unsuccessful sites, respondents perceived that there was a lack of knowledge amongst those who did violate the marine reserve. For example, one fisher said, "Those who violate [the marine reserve] do not know the marine sanctuary or the importance of the marine sanctuary."

Often when marine reserves are being designed and evaluated, the biological aspects of how connected reserves are and the social aspect of enforcement or compliance are heavily weighted. This research indicates that there may be a gap in how information is shared and transferred throughout fishing communities. There is not usually a linear path from knowledge to behavior change (Marcinkowski and Reid 2019). Knowledge about the marine reserve transfer occurs in these sites in different ways, both formally and informally. Formally, there is a communication pathway from NGOs and local government units to fishers through workshops and public meetings to disseminate regulatory and ecological information (Figure 1a). Informally, there is education that occurs with fisher to fisher conversation creating a societal norm of how to behave within the marine reserve and surrounding areas (Figure 1b). Interpersonal communication can increase compliance and create normative behaviors (Ostrom 2000). If informal or peer-to-peer knowledge sharing is an important part of MPA compliance, future MPA design should integrate social networks of fishing communities. This study highlights how perceptions vary across MPA sites and the importance of qualitative research in the potential success of marine reserve implementation.

KEYWORDS: community-based management, MPA, small-scale, fisheries

#### LITERATURE CITED

- Campos, W. L., & Aliño, P. M. (2008). Recent advances in the management of marine protected areas in the Philippines. *Kuroshio Science*, 2(1), 29–34.
- Marcinkowski, T., & Reid, A. (2019). Reviews of research on the attitude–behavior relationship and their implications for future environmental education research. *Environmental Education Research*, 25(4), 459–471. <https://doi.org/10.1080/13504622.2019.1634237>
- Marriott, S. E., Cox, C., Amolo, R. C., Apistar, D., Mancao, R. H., & de Mutsert, K. (2021). Implications of Community-Based Management of Marine Reserves in the Philippines for Reef Fish Communities and Biodiversity. *Frontiers in Marine Science*, 8, 731675. <https://doi.org/10.3389/fmars.2021.731675>
- Ostrom, E. (2000). Collective action and the evolution of social norms. *Journal of Economic Perspectives*, 14(3), 137–158.



**Figure 1** a) Formal communication pathway from local government and NGOs to fishers. b) Informal communication pathway between fishers, local fishers and bantay dagat, and bantay dagat and illegal fishers. Local fishers may not have effective peer-to-peer communication with illegal fishers.