

ADDRESSING AND ADAPTING TO CONTEMPORARY COASTAL MANAGEMENT ISSUES IN THE CENTRAL PHILIPPINES

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Introduction

With arguably the world's most decentralized coastal governance regime, the Philippines has implemented integrated coastal management (ICM) for over 30 years as one of the most successful frameworks for coastal resource management in the country. Anthropogenic drivers continue to threaten the food security and livelihood of coastal residents; contributing to the destruction of critical marine habitats, which are heavily relied upon for the goods and services they provide.

ICM initiatives in the Philippines have utilized a variety of tools, particularly marine protected areas (MPAs), to promote poverty alleviation through food security and sustainable forms of development. From the time marine reserves were first shown to effectively address habitat degradation and decline in reef fishery production (Alcala et al., 2001) over 1,100 locally managed MPAs have been established in the Philippines; yet only 10-20% of these are effectively managed (White et al., 2006; PhilReefs, 2008).

In order to increase management effectiveness, biophysical, legal, institutional and social linkages need to be strengthened and "scaled up" to accommodate a more holistic systems approach (Lowry et al., 2009). This summary paper incorporates the preliminary results of five independently conducted studies. Subject areas covered are the social and institutional elements of MPA networks, ecosystem-based management applicability, financial sustainability and the social vulnerability of coastal residents to climate change in the Central Philippines. Each section will provide insight into these focal areas and suggest how management strategies may be adapted to holistically address these contemporary issues.

MPA Networks: Social and Institutional Factors

The scaling up to MPA networks through the introduction of ecosystem principles has the potential to overcome the ecological shortcomings of single MPAs (Christie et al., 2005). However, scaling up must be done in a way that does not threaten community commitment or overpower institutional capacity (Christie and White, 2007). Social network analysis, a method for understanding social structures based on graph theory and statistics, is increasingly being recognized as an effective tool in natural resource management (Lauber et al., 2008). Our study examines the social network structure of a community in the Philippines with a successful, community-based MPA. Using social network analysis, influential actors in the network were identified and engaged in in-depth, semi-structured interviews.

We propose an increase in social network analysis for natural resource management by demonstrating practical implications for community members. Specifically, we offer strategic recommendations for increasing the potential of existing network structures with an emphasis on key actors and the development and maintenance of leadership abilities and qualities. Furthermore, we argue that an increase in a community's network potential is predicated on vertical linkages outside the immediate community network.

Several institutional conditions are necessary to ensure the success of MPA networks. In the Central Philippines, there is an emerging MPA network of municipal leaders and community members from 7 contiguous municipalities. Together, these municipalities contain 21 community-based marine protected areas that were previously individually designed and managed. Working collaboratively, the network is better able to enforce municipal waters, plan and manage MPAs, implement livelihood projects and finance these initiatives. To incorporate ecological networking standards, the council has begun harmonizing laws and policies. However, to date, the network lacks capacity to manage at larger scales. On-going support through technical knowledge and leadership assistance from a non-government organization with a longstanding relationship with municipalities will be necessary for the foreseeable future.

The ecological and collaborative benefits of MPA networks can be undermined if current challenges are not addressed. Scaling up requires balancing cross-scale linkages: horizontal linkages among groups at the community level and vertical linkages with local and national governments and non-government organizations (Berkes, 2006). The success of the network to date has resulted from previous coordination success at the single MPA level. This case study revealed that to be successful, MPA network institutions must harmonize laws and policies, maintain consensus and incentives for community level involvement and build technical and leadership capacity.

Ecosystem-based Management Applicability

As MPAs are being scaled up into networks, an ecosystem-based management (EBM) framework ensures that ecological and social connectivity issues are considered. EBM effectiveness therefore becomes an issue of context specificity and may incrementally emerge from previously implemented management efforts (Christie et al., 2009). A key challenge in implementing EBM in the Philippines is ensuring that the community-level dynamics that initiate, sustain and improve coastal resource management are not “lost in the shuffle” when racing to implement EBM strategies (Lowry et al., 2009).

Within this case study, the biophysical condition, local resource use patterns and prospective management frameworks were investigated to consider how large areas of Danajon Bank outer reef could be appropriately managed. Biologically suitable areas were identified and local resource use patterns mapped. Issues of contextualization, tradeoffs and compromise arose when exploring how to implement EBM at contextually relevant governance scales.

The suggested framework emerged from eight semi-structured interviews with primary MPA network stakeholders in Danajon Bank. Initial implementation efforts would remain at the municipal level, yet designated MPAs would be scaled up in size as success in both social and natural dimensions was demonstrated. Conceptualized as a compromise between donor program “wants” and implementing institution realities, donor programs would decrease the desired size of MPAs ($\geq 1000\text{ha.}$) while municipalities would agree to implement historically larger MPAs (ex. 100- 350ha.). In this manner, larger areas of critical reef habitat would be protected yet minimize the initial impact on local communities.

Financial Sustainability

The effectiveness of MPAs in the Philippines is often limited by a lack of necessary funds for management and maintenance costs, along with conflict related to the loss of livelihood for local fisherfolk. Tourism in the Philippines generates over US\$2 billion per year and is recognized as one of the top diving destinations in the world (UNWTO 2006). Successful marine tourism development in the Central Philippines has the potential to offset a large portion of protected area management costs through the generation of user/access fees and development of alternative livelihood projects. These components will act to fund long-term management and enforcement efforts.

This study, through interviews with dive tourism operators in Mactan, Cebu, presents the challenges for developing outer Danajon Bank, a rare double barrier reef formation, as an international diving destination. This study revealed that governments and conservation organizations alike must realize that the establishment of an MPA does not guarantee tourism dollars. Dive tourism operators are enthusiastic regarding the prospect of a new dive site that could have international appeal, indicating a willingness to participate in planning and implementation of the MPA. However, many are wary of high user fees before the MPA has a chance to recover into a high quality dive site. Research and planning as to the extent of future tourism potential must be considered before the promise of generated income can be made. Should tourism ventures fail after such promises, local communities may be likely to revert to unsustainable behaviors.

Climate Change

In the Philippines, climate changes poses yet another threat to already stressed resources and the livelihoods that depend on them. Furthermore, if adaptation measures are not considered, climate change threatens the success of MPAs and other marine conservation strategies. However, determining local adaptation measures first requires an understanding of specific local vulnerabilities.

To assess social vulnerability in Southeast Cebu, structured surveys were conducted to determine household's perceived risk to key coastal hazards: flood events, coastal erosion and sea-level rise; and, household's awareness of climate change. Survey data was analyzed to determine significant relationships using SPSS. Preliminary analysis indicates that fisherman perceive higher risk from all coastal hazards compared with urban laborers. Correlations also show that households located further inland perceive lower risk from coastal erosion and sea-level rise. No significant difference was found between coastal and inland households with respect to flood events. Thus, both occupation and spatial location should be considered when determining vulnerability to climate impacts. Climate awareness and perceived climate importance appear to be most closely linked with education and wealth, indicating that future education campaigns should be targeted at fishermen, lower-income households and households further from inland urban centers.

Conclusion

The case studies presented in this summary paper have demonstrated that sustained community-based inputs and support are essential elements of coastal resource management initiatives in the Philippines. However, existing anthropogenic threats and climate change threaten to increase vulnerability and therefore reduce the resilience of coupled human and natural systems. Coastal management problems have grown in scale beyond single MPAs and municipalities. In order to address large-scale issues such as ecosystem deterioration and climate change, the creation of appropriate institutional mechanisms that have the ability to consider, plan for and address these issues at their relevant scales is needed. In building these appropriate institutional mechanisms, the essential community elements will need to remain at the core and be built from the bottom-up. For this process to be successful, an improved understanding of social and institutional networks, ecosystem based management, financial sustainability mechanisms and climate change will be valuable to coastal managers.

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