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Review

Marine protected area networks in the Philippines: Trends and challenges for establishment and governance

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ABSTRACT

Marine protected areas (MPAs) are the most extensively implemented fisheries management and conservation tool in the Philippines. Most MPAs have been established and managed by communities together with local governments in a variety of community-based and co-management schemes. This approach has proven successful in gaining community acceptance and achieving local-scale fisheries and conservation objectives. However, the contribution of these MPAs to ecologically connected networks of MPAs is variable since most MPAs were not designed to be parts of networks. Nevertheless, there is growing support for the development of MPAs within the national integrated coastal management framework which supports the "scaling up" of MPAs to establish networks. Scaling up in the Philippine context is achieved by forging inter-institutional collaboration among neighboring local governments (i.e. village to provincial level), with the assistance of other institutions such as non-government organizations, academe, government agencies, and development partners including donors. Herein we review the history of MPAs in the Philippines and the development of inter-institutional collaborations and present examples of scaling up of MPAs to form networks. To further the establishment of social and ecological MPA networks in the Philippines, we describe approaches to forming MPA networks and discuss the fundamental elements of successful collaborative partnerships.

1. Introduction

Marine protected areas (MPAs) are defined by the World Conservation Union (IUCN) as parts of intertidal or subtidal environments, together with their overlying waters, flora and fauna and other features, that have been reserved and protected by law or other effective means (IUCN-WCPA, 2008). A MPA network is a group of individual MPAs that are ecologically and/or socially connected (White et al., 2006a; Christie et al., 2007; TNC-CI-WWF-WCS, 2008). Establishing networks of MPAs is widely recommended because networks offer broader ecological benefits than unconnected collections of MPAs (PISCO, 2007; IUCN-WCPA, 2008; UNEP-WCMC, 2008). A well designed ecological network of MPAs incorporates principles of adequacy, connectivity, representativeness, and resilience (UNEP-WCMC, 2008; IUCN-WCPA, 2008; Almany et al., 2009; McCook et al., 2009). The planning process for MPA networks considers hydrodynamic processes, ecological linkages, and ecosystem processes that help preserve ecosystem function. These dynamics are important in sustaining ecologically and economically important fish and invertebrate populations (White et al., 2006a; Planes et al., 2009). Socially, MPA networks can connect individuals and organizations to promote collaboration and sharing of information and experiences (White et al., 2006a; TNC-CI-WWF-WCS, 2008).

The development and management of MPA networks is also linked to broader trends in international conservation policy (e.g. Millennium Development Goals, Convention on Biological Diversity). International policies advocate ecosystem-based management, integrated coastal management (ICM), and regional designs of ecological MPA networks. These management schemes are based on the premise of the importance of conservation and sustainable use of biodiversity to preserve ecosystem function and support human uses and activities (Bensted-Smith and Kirkman, 2010; Chua, 2006). However, management and governance of large-scale marine systems is very complex and requires innovative approaches to link various institutions across multiple scales

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(Fidelman et al., 2012). Moreover, MPA establishment and management particularly in most developing countries, have been largely initiated by local communities without emphasis on the development of ecological or social networks (Alcala and Russ, 2006; Johannes, 1998; King and Faasili, 1998).

Among the benefits of community-based establishment and management of MPAs are increased participation and acceptance by the people affected by the constraints on resource use (Aswani et al., 2007; Christie et al., 2002). Community-based MPAs have been effective at achieving local-scale fisheries and conservation targets (Alcala and Russ, 2006; Govan et al., 2009). However, the resulting MPAs are typically small (usually <1 km^2) and do not consider ecological connectivity (Weeks et al., 2010). These small MPAs have the capacity to contribute to local biodiversity conservation and fisheries targets. However, these might not contribute substantially to wider objectives such as connectivity and resilience to climate change due to the lack of consideration of regional-scale ecological processes and broad-scale gaps in and objectives for biodiversity conservation (Sala et al., 2002; Weeks et al., 2010). There are however, numerous efforts to scale up locally managed MPAs to establish social and ecological MPA networks through collective action (Lowry et al., 2009).

Scaling up individual, locally established MPAs to form networks is seen as a means to attain conservation objectives and accelerate enhancement of coastal resource and ecosystems. These aims are achieved by improving the design (e.g. size and location) and management of MPAs, both typically hindered by governance and financial constraints (Aliño et al., 2006). Theoretically, scaling up to form MPA networks, in the context of integrated coastal management, involves three kinds of considerations for expansion: 1) geographical, 2) functional and 3) temporal (Chua, 2006). Geographical expansion refers to the shift in attention and coordination from smaller to larger areas (e.g. local jurisdictions to entire habitats or coasts). Design and management of the MPAs then encompasses larger areas, and hence requires functional (or operational) expansion with regards to management issues. Functional expansion involves adding more personnel and restructuring the management bodies in charge of the MPA networks. Members of management committees should have clear roles and responsibilities for MPA network design, enforcement, monitoring and other management activities (Junio-Meñez et al., 2007). Temporally, expansion will involve prioritization of activities, and incorporating MPA management into broader and institutionalized schemes (Pomeroy et al., 2010). In terms of temporal expansion, scheduling and establishment of new MPAs should consider where to place additional MPAs to minimize loss of biodiversity in the face of continuing threats (Visconti et al., 2010). MPA management should be institutionalized locally to prevent lapses in governance due to changing political figures and/or termination of donor-assisted projects (Chua, 2006).

The call for scaling up MPAs to form networks coincides with the call for integrated coastal management (ICM) in the Philippines (Aliño et al., 2006; Chua, 2006; White et al., 2005). The main focus of ICM is the management and sustainable use of coastal and marine uses in a spatial context that supports participatory planning and sustainable development. Establishing and managing MPA networks is linked to ICM since MPAs are affected by human activities outside their boundaries (Chua, 2006; Junio-Meñez, 2008). Hence, incorporating MPA networks into ICM is complementary and needed to promote collective action and address transboundary problems related to human activities (Chua, 2006).

There are numerous efforts to form MPA networks in the Philippines. These involve collaborative efforts of communities, municipal governments, and other institutions (Armada et al., 2009; Eisma-Osorio et al., 2009). However, the process of scaling up and development of MPA networks has not yet been properly documented and described in the literature. Moreover, there is also a need to gather and consolidate information on MPA networks that are being established and maintained in the country. Herein we review the history of MPAs in the Philippines, the development of inter-institutional collaborations, and efforts to scale up MPAs and their management. We describe moves to create MPA networks and examine the approaches used, with the aim of defining the minimum requirements for collaborative efforts to establish social and ecological MPA networks. Key challenges experienced in establishing and managing MPA networks are also identified.

The Philippines offers an instructive case study due to its high biodiversity (Carpenter and Springer, 2005; Nañola et al, 2010), high dependence on coastal and marine resources (Gomez et al., 1994; Nañola et al, 2010), rapidly developing coastal areas, decentralized government system, and long history of MPA establishment and governance (Aliño et al., 2004). While Philippine experiences in MPAs and ICM are well documented and cited, this review provides planners, resource managers and policy makers with current and strategic lessons on how scaling up MPAs to form networks can be achieved, and what associated constraints and limitations need to be addressed.

2. Methodology

We conducted a review of literature to gather and summarize relevant legislation, projects and events related to MPA establishment and management, inter-institutional collaboration, and MPA networks in the Philippines. The search criteria were MPAs (including marine reserves, sanctuaries, and no-take areas), biodiversity conservation, fisheries management, inter-institutional collaboration, ICM, and Philippines. The references used included peer-reviewed journal articles, book chapters, technical reports, legislation, and conference and workshop proceedings. These references were either downloaded online or obtained from various libraries and/or resource persons.

We compiled a database on MPA networks and local government alliances from the literature review and added this to the MPA database from the University of the Philippines Marine Science Institute and MPA Support Network (MSN). The information in MSN's database is limited to individual MPAs and does not include information on collaborative efforts to establish and manage MPA networks. The addition of information on MPA networks updated the MPA database (e.g. new MPAs as of 2010 and amendments to MPA sizes and geographic coordinates).

We also conducted semi-structured qualitative key informant interviews. The key informants were comprised of government officials, members of non-government organizations, and academics with experience in MPAs, MPA networks, and institutional collaboration. The aims of the interviews were to validate the history and timeline of events from the literature review and verify locations of the MPA networks and collaborative efforts implemented. Moreover, the interviews were used to document lessons and experiences of the key informants to describe the process of scaling up MPAs and identify challenges encountered when establishing and managing MPA networks and maintaining collaborative partnerships. The challenges identified were based on historical accounts on inactive alliances from the literature and from interviews.

3. The Philippine experience with MPAs

Established MPAs in the Philippines vary in objectives (Aliño and Uychiaoco, 1999), level of protection and allowed use, and mode of establishment and management. The first MPA established