A comparative study of adaptive capacity of Marine Protected Area management in Mauritius

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Submission track: Capacity Development and Outreach

ABSTRACT:

Objective: This study aims to evaluate the adaptive capacity of the Marine Protected Area (MPA) management agencies of three Western Indian Ocean nations namely Mauritius, Tanzania and Seychelles.

Background: MPAs are areas of the ocean designated by law or other effective means to enhance conservation of marine resources through restrictions on fishing and other exploitative practices (Dudley, 2009). Given the perceived success and potential of well-managed MPAs, governments worldwide are aiming to incorporate 10% of oceans as MPAs, as per the Convention of Biological Diversity's Aichi Target 11. The aim is to ensure that coastal and marine areas are protected through effectively and equitably managed, ecologically representative and efficient area-based conservation measures.

However, research suggests there are few well-managed MPAs (Sala et al., 2018). Existing MPAs are very often poorly operated (Sala et al., 2018), thus failing to provide expected ecological (e.g. coral reef recovery, increased fish biomass) and social benefits (e.g. increased revenue from small scale fishing). Investigating MPAs as part of linked social-ecological systems is needed to understand the intricacies of such socio-ecological systems, which may help in informing better design and management of MPAs (Cinner et al., 2012).With the intense effects of climate change that have already impacted on people and the ecosystems they rely on, there is a dire need to boost the capacity of coastal communities to adapt. Adaptive capacity is defined as "the conditions that enable people to anticipate and respond to change, to minimize the consequences, to recover, and take advantage of new opportunities" (Cinner et al., 2018), which relies on five critical components: the assets people can utilize in times of need, the flexibility to alter strategies, the ability to self-organize and take collective action, learning to recognize and respond to change and finally, the agency to decide whether to change or not (Cinner et al., 2018). A fundamental component involves ensuring that individuals, communities and societies are actively involved in processes of change (Pettengell, 2010). This pertains specifically to changes in behaviour and also resources and technologies.

The Strategic Adaptive Management (SAM) approach has been developed in the WIO with WIOMSA support to train MPA managers to use a proactive, science-based approach to MPA

management by connecting science to adaptive management. So far, SAM has been implemented in Kenya (since 2009), Tanzania (since 2013) and Seychelles (since 2016), in collaboration with the national MPA agencies within each country.

The main component of adaptive management using the SAM approach is the robust link between monitoring data and using the information generated to influence decision making. Among other actions, SAM collaborates with managers and fishing communities to develop management objectives based on community goals and values, which are subsequently used to set numeric targets that are scientifically reviewed. They help managers determine what data are required to evaluate progress towards objectives and train them in monitoring ecological and social parameters to fill gaps in data, essential to enable managers and communities to stay aware of the MPA status. By engaging managers and involving communities in monitoring, SAM aims to build an increased understanding and passion for the conservation of marine resources in MPAs.

Research Question: What is the adaptive capacity of the MPA management agency in Mauritius, a non-SAM country in the Western Indian Ocean, compared to Tanzania and Seychelles, two SAM countries in the Western Indian Ocean?
I will evaluate this in the context of how different components of adaptive capacity are likely to affect the uptake of adaptive management, using data from Mauritius and past surveys of adaptive capacity in Tanzania and Seychelles MPAs.

Methods used: Through a series of surveys and interviews aimed at MPA managers in Mauritius, we compare MPA management, managers' skills, sense of place, and connectedness to nature. We use the results to evaluate what steps are needed to help Mauritius continue to build its MPA system and whether an evidenced-based management system like SAM could be implemented successfully in Mauritius.

Summarised results and conclusion: Our results show that management in Mauritius is mostly top-down, with most enforcement officers having relatively low level of knowledge about key ecosystem functions or the importance of MPAs for socio-ecological benefits. They also tend to have low involvement in decision making. In terms of describing the value of MPAs, most enforcement officials in Mauritius viewed MPAs as successful if laws were enforced and illegal activities were limited. In comparison, officials affiliated with the Fisheries Research Centre in Mauritius elaborated more on the ecological benefits of MPAs, pollution control, and efforts to raise awareness, improve the legal framework, and funding. In Tanzania, responses from enforcement officers as to the success of an MPA were more varied and ranged from improved outcomes like wildlife monitoring, healthier ecosystems, good coral cover, and fewer illegal activities, as well as the identification of the need for more trained staff and the need to increase tourism revenue from MPAs. In Seychelles, enforcement officers focused on good management, enforcement, and the availability of appropriate equipment. Countries with the SAM approach emphasize flexibility, peer to peer learning, adaptive and evidence based management more broadly. We observed lower engagement and connectedness to the natural environment in Mauritius as compared to the other two countries. Therefore, because enforcement officers currently seem less actively involved in activities or aware of decisions made around MPAs than enforcement officers in SAM countries, Mauritius may be a good candidate for future adoption of the SAM approach to improve adaptive capacity within the existing MPA management agency.