

Strengthening small-scale fisheries management and conservation in Myanmar through locally managed marine areas

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Abstract The NGO Fauna & Flora started working in the Myeik Archipelago, southern Myanmar in 2013, and in 2017 three locally managed marine areas were established to aid sustainable fisheries management and support biodiversity conservation. These sites are the first protected areas specifically established for co-management of marine fisheries in Myanmar, in which long-term management rights have been formally granted to local fishing communities. The establishment of a further four locally managed marine areas is now in progress, with ambitions for a network to be established throughout the archipelago. To track changes in these habitats over time, assess effectiveness and inform adaptive fisheries management, annual coral reef monitoring will be conducted at these community-managed sites. We provide an overview of the locally managed marine areas recently established in Myanmar and of proposed new sites, and detail the establishment of the first permanent coral reef monitoring transects. In sharing the initial evidence gathered on the impact of new, local management measures, we aim to highlight the importance and benefit of developing marine resource management systems to strengthen fisheries management while simultaneously establishing a monitoring framework to fill a national and global coral reef data gap.

Keywords Coral reef monitoring, fisheries management, locally managed marine area, marine conservation, Myanmar, Tanintharyi

The Myeik (formerly Mergui) Archipelago, in southern Myanmar in the north-east Andaman Sea, comprises > 800 islands scattered over an area of c. 34,000 km². This archipelago remains one of the least studied coral reef ecosystems, and there is a paucity of scientific information on the diverse marine habitats of this region (Howard, 2018). In addition, a growing body of evidence suggests these

coral reef areas are threatened by overfishing, destructive dynamite fishing and trawling, impacts associated with climate change, increased sedimentation from terrestrial run-off, and pollution. In this context, one method of protecting marine environments, and the livelihoods of communities dependent upon them, is through the use of locally managed marine areas. These are a form of collaborative and adaptive fisheries management, where local resource users actively manage their waters with the support of NGOs, locally and nationally relevant institutions, and private interests (Govan et al., 2008). Management measures are continuously reviewed and adapted by stakeholders as required.

In the Myanmar context, a locally managed marine area differs from a conventional marine protected area in that the former is characterized by local ownership and management, often following traditional tenure and management practices. In contrast, marine protected areas are typically designated via a top-down governmental approach, with management led by a centralized agency (Govan et al., 2006). Marine protected areas often fall short of their original goals because of various factors, including significant ongoing lack of funding, low community engagement, and inadequate or ineffective enforcement (Roccliffe et al., 2014). In contrast, locally managed marine areas have garnered increasing support because of their adaptability to different contexts and focus on locally identified objectives that are negotiated and implemented by local stakeholders (Jupiter et al., 2014). They have also been identified as one of the most effective ways of achieving sustained and cost-efficient outcomes (Govan et al., 2008), although the objectives may not be explicitly focused on marine conservation, but rather prioritize sustainable resource management by local stakeholders. In Myanmar, other models have been successfully tested, such as the fisheries co-management areas in Rakhine State. The main difference between these models, and the reasons further developments will follow the locally managed marine areas model, is that, in the Myanmar context, such areas are smaller (suitable for small, island-based communities) and provide exclusive right of access to resources for local communities.

The NGO Fauna & Flora began working in the Myeik Archipelago in 2013, conducting extensive surveys to assess the status of habitats and species, and to identify important

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areas for protection. After a further 2 years of consultation with community groups and other stakeholders, Myanmar's first three locally managed marine areas were formally designated in September 2016 and legally confirmed in March 2017. Two of the participating villages, Lin Lon and Done Pale Aw, lie in the northern Myeik Archipelago around Thayawthadangyi Island, and Langann lies further south (Fig. 1). The notification of each locally managed marine area includes boundary delimitation, location of permanent and seasonal no-take zones, and appropriate rules and regulations. These are the first such notifications designed specifically for co-managed marine fisheries in Myanmar (Howard, 2017).

There is no explicit reference to locally managed marine areas or other co-management initiatives in the current Marine Fisheries Law and their legal recognition is stated in the official notification issued by the Fisheries Director General, which refers to an article in the Marine Fisheries Law that allows the government to delegate authority over natural resources to local communities. Extensive efforts had been invested by the Department of Fisheries, fisheries

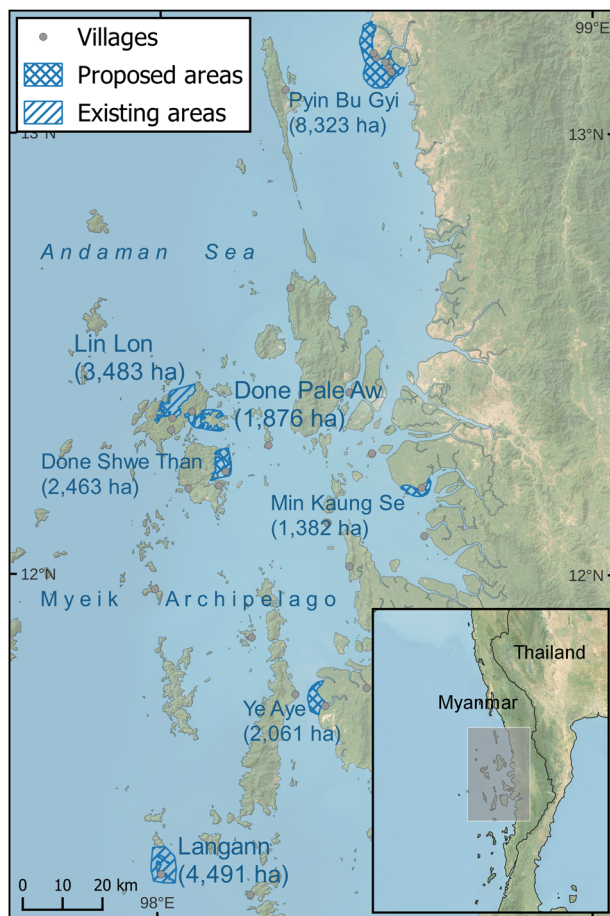


FIG. 1 Existing (Lin Lon, Done Pale Aw and Langann) and proposed (Pyin Bu Gyi, Done Shwe Than, Min Kaung Se and Ye Aye) locally managed marine areas in the Myeik Archipelago, Tanintharyi, Myanmar.

organizations and international NGOs in drafting a new law that that will include a clear regulatory framework for this kind of initiative. Unfortunately, the work was suspended when the military forces took power in 2021. Nevertheless, the legal validity of locally managed marine areas and other fisheries co-management models has been confirmed and all parties are bound to respect their rules and regulations. In working towards establishing a locally managed marine area network, Fauna & Flora also worked collaboratively with the Forest Department and the Department of Fisheries to develop a wider marine protected area network throughout the Myeik Archipelago. There has been significant work to design and develop a marine protected area network plan, and to draft a spatial plan, including mapping and zonation for various levels of proposed protection (Becker et al., 2017). The Myanmar government also established the National Committee for Coastal and Marine Conservation to coordinate the different government bodies responsible for development and designation of this marine protected area network. Fauna & Flora is working to ensure that the locally managed marine area fishing communities participate in marine protected area planning consultations, so that the rights of local fishers are respected within new marine protected areas.

The process for designation (Fig. 2) that was followed for the first three locally managed marine areas is being repeated for the new areas, with minimal differences except for the environmental and social management system, including the expression of free, prior and informed consent, which has been strengthened in light of the current political situation. Each locally managed marine area is managed by a committee, which varies in size depending on the location, and comprises various ethnic groups, and fishers of different types and genders. Management plans for each site have been developed and approved, and Fauna & Flora has provided a patrol boat for each locally managed marine area, to help enforce regulations and promote compliance. Since 2019, Fauna & Flora has also provided these communities with small grants that allow local people to manage diversified livelihood projects, including crab banks for blue swimming crab *Portunus pelagicus*, village savings and loans associations, small-scale livestock rearing, and other agroforestry projects (Howard, 2017).

The establishment of the first locally managed marine areas in Myanmar has engendered considerable interest amongst other villages in the Myeik Archipelago, with several other communities coming forward to indicate their enthusiasm for the idea. Currently, there are a further four areas that have been proposed as new locally managed marine areas within the Myeik Archipelago: Pyin Bu Gyi, Done Shwe Than, Min Kaung Se and Ye Aye. This scaling-up will promote the involvement of communities in decision-making and empower communities to manage their own resources, with the ambition that a network of devolved

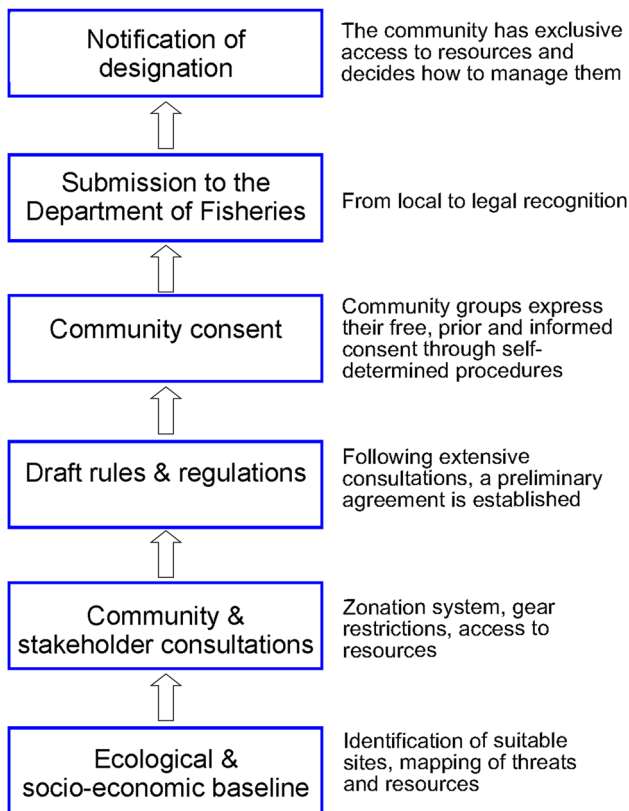


Fig. 2 Summary of the locally managed marine area development process adopted by Fauna & Flora in Myanmar. Starting with an ecological and socio-economic baseline assessment in the villages of Done Pale Aw, Lin Lon and Langann (Fig. 1), the process then focused on extensive community consultations, which led to an initial draft of rules and regulations. The draft was submitted to communities for a final review, which, following minor revisions, was adopted as the final document. This was then submitted to the Department of Fisheries, which issued an official designation through a Notification of the Fisheries Director General.

fisheries management areas will be established in the Myeik Archipelago and across other coastal areas of Myanmar.

One critical component of implementing locally managed marine areas is annual coral reef monitoring, which is conducted to track temporal changes in benthic and reef fish communities and thus examine reef ecosystem resilience. This is crucial to inform adaptive management of these habitats by local communities, particularly for economically important fish species. In February 2019, the first permanent reef monitoring transects were installed at four sites within Lin Lon, and the first annual surveys of benthic and fish communities were conducted. Substrate, mobile invertebrate, reef fish and reef impact (e.g. from ghost gear and dynamite damage) data are collected using a modification of the Reef Check method (Hodgson et al., 2006).

The plan is that permanent transects, with annual monitoring, will be established at every subsequently created locally managed marine area that includes suitable coral

reef habitat. As time-series coral reef data are not currently available for the Myeik Archipelago, this will help fill the knowledge gap for this area.

To date, Fauna & Flora’s work in the Myeik Archipelago has sought to utilize locally managed marine areas as a collaborative management tool to achieve sustainable fisheries and effective, equitable marine conservation. The perceived value of this approach among participating communities was evident when socio-economic surveys were conducted in 2016, with 88% of survey respondents expressing a positive view of the locally managed marine areas. These results were confirmed in 2019, when the survey was replicated, 2 years after the official designation. In both cases, community representatives were asked if the locally managed marine area model could be beneficial to their livelihoods and if they were generally happy with how the locally managed marine area was being managed. This has subsequently encouraged more communities to be positively engaged, driving the scaling-up of this local management approach. Anecdotal evidence suggests reductions in destructive fishing within the established locally managed marine areas, particularly dynamite fishing, although continued monitoring is required to confirm this. While coral reef baselines are still being established, however, it is too soon to discern any ecological impact of the implementation of these locally managed marine areas. It is therefore important that long-term ecological monitoring continues, to track changes in marine ecosystems and examine the effectiveness of community-driven management as a viable approach for fisheries sustainability and marine conservation. Scientific research within these locally managed marine areas will also continue to fill an important information gap in a poorly researched region of global marine conservation importance (Howard, 2018).

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Conflicts of interest None.

Ethical standards This research did not involve human subjects, experimentation with animals or collection of specimens, and abided by the *Oryx* guidelines on ethical standards.

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