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# Challenges for effective and sustainable co-managed Marine Protected Areas: a case study from the Comoros Islands

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**Abstract.** Co-managed MPAs must strike a difficult balance between development and conservation objectives and although terrestrial co-management initiatives for parks and reserves have been extensively studied, few evaluations have been conducted of co-managed MPAs. Mohéli Marine Park was the first MPA to be established in the Comoros in 2001. Initially regarded as a model for co-management of marine resources, the MPA is now operating at a vastly reduced capacity following an end to external funding sources. This study assessed current perceptions of local stakeholders of the MPA to evaluate the successes and challenges of the co-management approach. Concern was expressed for the lack of sustainability or alternative livelihoods; inequitable distribution of benefits; exclusion of women; continuing environmental threats and a concurrent lack of enforcement of regulations. MPA managers should carefully consider their options for sustainable sources of finance and lower-cost alternatives to ensure that management activities can continue beyond initial set-up funding. Donors potentially need to rethink policies for initiatives such as MPAs which may be more effectively implemented with a decentralized approach and long-term but consistent funding commitment over at least several years rather than current two- to three-year project cycles that generate visible but short-term results for the implementing team and donors and fail to deliver effective conservation and development outcomes for communities and their marine resources in the long-term.

**Key words:** Co-management, Mohéli, Comoros, Marine Protected Area, MPA

## Introduction

The linkages between human and natural systems and the need for natural resource management approaches that address these linkages are widely recognized (e.g. Mascia et al. 2003). The success of Marine Protected Areas (MPAs) is intrinsically dependent on the behaviour of people in their use of coastal and marine resources (Bromley 1991; Francis et al. 2002; Francis and Torell 2004; McClanahan et al. 2006), thus MPA managers must strike a difficult balance between conservation and livelihood goals. Local stakeholders' perceptions of an MPA are an important indicator of its success and these perceptions will significantly influence their behaviour (Pollnac et al. 2001). Thus the co-management approach, whereby local stakeholders have considerable input into the setup and management of an MPA, has been widely recommended as a means to address these issues. Co-management systems have long been applied to terrestrial ecosystems but have been negatively criticized on their sustainability and appropriateness to local conditions. In a review of 23 such projects in Africa, Asia, and South America, for example, Wells

et al. 1992 noted that 'measurable progress has been rare' and they concluded that all projects had failed to meet their stated objectives because 'the critical linkage between development and conservation is either missing or obscure'. However, few independent assessments of the sustainability and effectiveness of MPA co-management have been conducted.

Mohéli Marine Park (*Parc Marin de Mohéli*; Fig. 1), established on 19th April 2001 was initially regarded as a flagship example of MPA co-management, with a committee composed of representatives assembled from ten local villages, government, police and tourism operators (IUCN 2002; Gabrie 2003; Granek and Brown 2005). The MPA was created through the five-year United Nations Development Programme (UNDP) / Global Environment Facility (GEF) funded project 'Conservation of Biodiversity and Sustainable Development in the Federal Islamic Republic of the Comoros' (Project Biodiversity) (IUCN 2004). Currently, the MPA is operating at a vastly reduced capacity following the end of Project Biodiversity, and subsequent end in funding (Wells 2005; C3-Comores 2007, Hauzer et al. 2008). This study

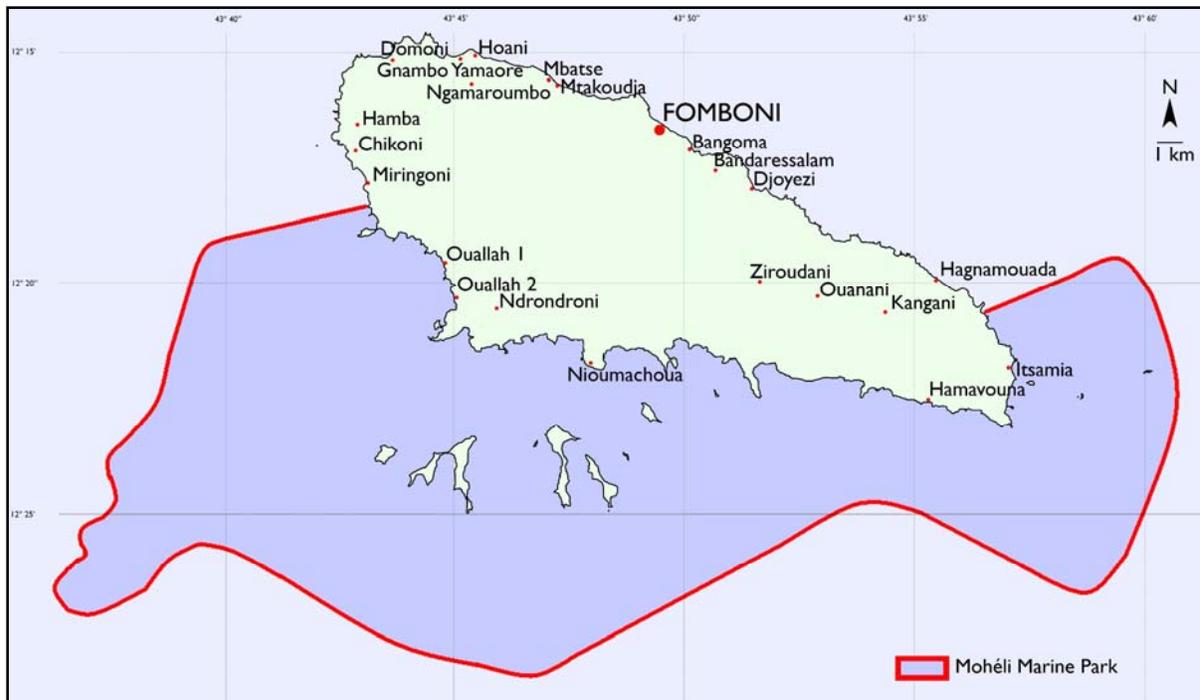


Figure 1: Mohéli, showing the Marine Park and local villages

involved an assessment of the perceptions of local stakeholders of Mohéli Marine Park to assess the challenges that have led to the demise of the once extremely promising co-managed MPA within five years of its establishment.

### Material and Methods

Semi-structured interviews were conducted, following guidelines from Bunce et al. 2000, consisting of 12 questions based on six key parameters: (1) basic awareness, (2) value, (3) effectiveness, (4) environmental threats and solutions, (5) stakeholder roles and responsibilities and (6) future aspirations and expectations. The interview was designed to allow for open discussion in a focus group format and relevant follow-up questions were posed during each interview according to participants' responses to the key questions. Participants were selected to encompass the full diversity of stakeholders and male and female focus groups were strictly held separately to ensure that women would feel at ease in voicing their opinions. One male and one female focus group interview was carried out between 10th July 2006 and 20th August 2006 in each of the 10 villages of Mohéli Marine Park: Miringoni, Ouallah 1, Ouallah 2, Ndrondroni, Nioumachoua, Ouanani, Kangani, Ziroudani, Hamavouna, and Itsamia (Fig. 1).

### Results and Discussion

Dialogue during the focus group interviews identified a number of positive and negative aspects of Mohéli

Marine Park (Table 1). The 11 positive aspects identified corresponded fairly closely with the MPA's original objectives (Gabrie 2003), and participants in all villages believed that the MPA was important. However, the 18 negative aspects identified reveal significant shortfalls in the MPA's management regime.

Problems with sustainability at all levels were identified as the primary negative aspect of the MPA (Table 1). To ensure financial sustainability, Project Biodiversity laid the groundwork for a Biodiversity Trust Fund for the Comoros, including management of protected areas (Bayon 1999). However, a longer time-scale and greater level of capitalization than originally envisaged were required to set up the Fund (Wells 2005).

In the absence of the Trust Fund to cover base management costs, no contingency plan for sustainable funding and no lower-cost alternative for its management, Mohéli Marine Park's financial situation was uncertain following the end of Project Biodiversity in 2003. This was evident to local communities who remarked on the reductions in management effectiveness, activity and levels of enforcement after Project Biodiversity ended (Table 1), and led them to believe that they had been the victims of 'false promises' of the Project as illustrated by the following quote from the Ouallah 1 male focus group: *'Since Project Biodiversity finished, we now say that the words 'Marine Park' do not exist. There has never been follow-up to anything that was*

*implemented during the project. With the project, we stopped all of the harmful activities that we were told to stop. However, we saw that we gained nothing, and now, bit-by-bit, we have started engaging in harmful activities again. Moreover, the management of the Marine Park now remains only in the hands of a few individuals, this is the reason that there is more damage occurring now than before, people have lost respect for the Marine Park. To make matters worse, the ecoguards were abandoned as soon as the project finances stopped.'*

Table 1: Positive and negative aspects of Mohéli Marine Park identified by focus groups in approximate order of significance (Hauzer et al. 2008)

Positive aspects	Negative aspects
1. Environmental protection and a reduction in environmental destruction	1. Lack of sustainability
2. Increase in fish (size or number)	2. Lack of effective monitoring or enforcement
3. Prohibition of fishing gears	3. Lack of respect of Park personnel for official agreements
4. Increase in environmental consciousness	4. Poor management of equipment
5. Ecotourism	5. Absence of Park personnel
6. Increase in coral cover	6. No positive aspects
7. Exchange and increase in information through international interest	7. Prohibition of fishing gears
8. Infrastructure development	8. Lack of collaboration between Park, external organizations and villages associations
9. Reduction in unemployment	9. Insufficient environmental training, education, and awareness raising
10. Official permission for villages to protect their coastal zone	10. Lack of management of forestry activities
11. Presence of ecoguards	11. False promises of Project Biodiversity
	12. Absence of female participation
	13. Lack of benefits
	14. Lack of motivation
	15. No visible zoning of Park boundaries
	16. Inequitable distribution of benefits
	17. Environment in a worse state since the creation of the Park
	18. Lack of waste management

Lack of effective monitoring or enforcement ranked second for negative aspects of the MPA (Table 1). This issue was raised in eight villages, where respondents stated that a lack of permanent monitoring and enforcement had led to continued turtle poaching and destructive fishing practices. This in itself further de-motivated local communities as those abiding by the regulations were perceived to be the losers whilst perpetrators benefited from freely exploiting resources without due reprimand. The sheer scale, promises and community-conservation rhetoric of Project Biodiversity overwhelmed the

local residents, raising their expectations in terms of anticipated benefits. Following the end of funding, communities were unwilling to accept the potential of low-cost, community-driven conservation initiatives, preferring to leave enforcement to the one or two salaried ecoguards who had been appointed by Project Biodiversity from their village. In this way, community motivation for natural resource management was, in some ways, reduced by the creation of Mohéli Marine Park as stakeholders became disillusioned by the lack of activity and tangible benefits following Project Biodiversity.

A lack of transparency in the management of Mohéli Marine Park and inequitable distribution of its benefits were major concerns voiced by local communities (Table 1). Stakeholders felt that benefits were being concentrated in the village of Nioumachoua, which housed the headquarters of the MPA or villages such as Itsamia that host more conspicuous marine attractions such as turtles. As illustrated by Mohéli Marine Park, employment in MPAs can be socially exclusive, in that the benefits accrue to a narrow subset of the local population. Often those employed are primarily from the best educated and motivated of their communities (one of the two senior staff of Mohéli Marine Park was not even Mohélian) rather than from the subsistence-stressed subpopulations that are the most likely to participate in illegal activity in the protected area (Barrett and Arcese 1995). This problem was recognized in 2001, when the gillnet and spear fishers of Nioumachoua expressed their dissatisfaction that Nioumachoua's alternative income-generating scheme (ecotourism facilities) had failed to provide them, the 'victims' of the MPA, with any benefits (Loupy 2001). These views regarding distribution of benefits were a root cause of the ubiquitous feelings of resentment towards the MPA. This dissatisfaction and distrust have clearly contributed to stakeholders' non-compliance with regulations and their unwillingness to actively participate in effective co-management.

It became evident through focus group interviews and discussion with MPA staff that Ndrondroni and Hamavouna were the most socially- and economically-marginalized villages and the also most excluded from its activities. Unsurprisingly, they were also the two villages most notorious for turtle poaching and a lack of compliance with MPA regulations, which was blamed on the communities' Anjoanais origin (Boinali, pers. comm. 2006). Furthermore, as both villages have poorer infrastructure and services when compared to the other eight villages, they are also less likely to gain any direct benefits from tourism.

Generation of income through ecotourism was one of the key objectives of Mohéli Marine Park (Gabrie 2003) and was recognized by communities as a positive aspect (Table 1). However, tourist arrivals have declined since the MPA was established and communities complained that they were inadequately trained to host tourists and provide guides, accommodation and other services. Local capacity and infrastructure must be considerably improved for ecotourism to provide a significant alternative income on Mohéli (C3-Comores 2008). Although tourism is widely touted in co-management projects as having great potential to generate compensatory income, it has yet to deliver substantial sums as a result of the extreme variability in tourist revenues in response to political turmoil, exchange rate fluctuations and international economic conditions (Barrett and Arcese 1995).

Prohibitions on fishing gear (gillnetting, spearfishing, dynamiting and poisoning) were identified as a constraint by several communities (Table 1). The main concern was the reduction in catch as a result of restrictions, particularly during rough weather. There was also no consensus among communities on the actual effects of these regulations on fisheries yields. Without demonstrated fisheries-enhancement effects, Mohéli Marine Park will be unable to win over fishers who have lost income following gear prohibitions and area closures. Certain communities respected regulations but felt that their efforts were futile because fishers in other villages continued to use banned methods, benefiting from greater catches and a number of fishers felt that they had not received adequate compensation, such as alternative sources of income, alternative fishing gear and/or training in new fishing techniques.

Project Biodiversity and other initiatives have, in the past, attempted to address these issues through the provision of motorized boats to fishers. However, logistical complications arose concerning the means for many fishers to share a single motorized boat and these projects have only caused conflicts in all villages that were involved in them. Some villages decided that the boat would not be exclusively used for fishing but also for tourism, transporting goods and passengers to other islands. Disputes also occurred if the boat or engine was damaged (Loupé 2001). This lack of positive conservation outcomes from incentive projects reoccurred in almost every village involved in the MPA and a lack of follow-up or formal evaluation of these alternative income generation schemes has made it impossible to learn lessons in order to improve such projects in the future (Malleret 2004).

## Conclusion and Recommendations

It is clear that local stakeholders must be adequately informed of, consulted throughout and involved in the effective and sustainable management of MPAs. However, this work shows that in reality, there are pertinent and often overlooked challenges that must be overcome to implement co-management, particularly for large-scale projects. Although the Mohéli Marine Park project was a major, well-funded undertaking which employed international experts throughout the assessment and implementation stages, Mohéli's communities and their natural resources may now actually be worse off, not only materially but also through their altered perceptions of international donors and marine conservation.

The significant funding expended on the Mohéli Marine Park project and evident lack of sustainability after only five years of operation underscore the fact that large amounts of money do not necessarily ensure greater success in fulfilling management objectives. Perhaps more worrying are the unrealistic expectations conferred to local stakeholders from the beginning of the project which could only result in disappointment and disillusionment when promises could not be fulfilled. This now creates a conundrum for future work in Mohéli Marine Park because stakeholders are now unmotivated and wary of external interventions.

In the case of Mohéli Marine Park, tourism was the only large scale alternative livelihood option that was implemented to any extent. Perhaps it would have been more cost-effective to have conducted a detailed market analysis which would have revealed the need for a marketing strategy in tandem with the creation of tourism infrastructure. Now, although the buildings exist, without funding or the ability to market their tourism product, local communities will find it difficult to gain any revenue from tourism (C3-Comores 2008). Had sufficient consultation taken place with the fishers, the most relevant stakeholder group, alternative fishing gears and relevant training sessions could have been held to help offset losses in income due to area closures and gear restrictions. Inclusion of women in separate consultations would have revealed their significant roles in household income generation and provided options for developing their artisanal industries to offset losses in household income through restrictions in fishing activities. Such activities would be less reliant on external factors than tourism and thus potentially more sustainable in the long-term.

Donors need to pay more attention to long-term outcomes when considering a co-managed MPA project, and spreading available funding over five or ten years would potentially allow for more equitable distribution of benefits as management is adapted as

the MPA develops. This is particularly significant in cultures where effective and inclusive decision making processes work at a much longer time scale than the donor's project schedule. Experience has shown (Borrini-Feyerabend et al. 2004) that to achieve success, stakeholder-inclusive conservation projects often operate more effectively at small decentralized scales with small infusions of money over longer project terms. This smaller-scale approach to marine resource management on Mohéli may have allowed for a sustained management programme, better adapted to local capacity with reduced levels of conflict between the 10 villages. The negative correlation between the size of conservation projects and their effectiveness and success is supported by a report on GEF projects that determined that they had generally been a major failure except for the Small Grants Programme (Horta et al. 2002).

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