

Mohéli Marine Park, Comoros Successes and Challenges of the Co-Management Approach

MELISSA HAUZER, CHRIS POONIAN* & CHEIKH MOUSSA IBOURA

Community Centred Conservation (C3), C3-Comores, BP 8310, Iconi Grande Comore, Union of the Comoros, Tel. +269 73 75 04, GSM +269 36 75 06, <http://c-3.org.uk/>

*chris@c-3.org.uk

ABSTRACT

Mohéli Marine Park (*Parc Marin de Mohéli, PMM*) was the first Marine Protected Area (MPA) to be established in the Comoros in 2001. Initially regarded as a model for co-management of marine resources, PMM is now operating at a vastly reduced capacity following an end to external funding sources. An assessment of current perceptions of local stakeholders of PMM was recognized as an essential first step in rebuilding its capacity and effectiveness as an MPA. This study aimed to ascertain stakeholders' current perceptions of PMM, using focus group interviews to evaluate 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. It was apparent that most local communities were aware of the importance of PMM, but felt that it had failed to include their needs or consider their input in its management. 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. The key recommendations to arise from this work were: (1)

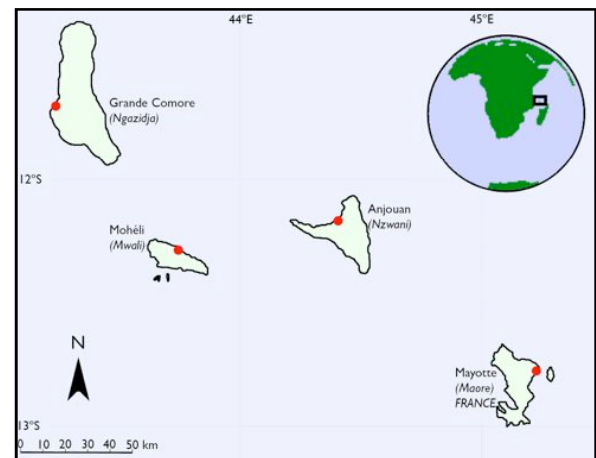


Figure 1. Union of the Comoros and Mayotte.

ensure sustainability through effective financial planning and promotion of low-cost, appropriate management techniques; (2) mobilize local communities to create a truly co-managed PMM; (3) ensure tangible benefits to local communities through realistic alternative livelihood options, particularly for fishers; (4) ensure equitable sharing of benefits and awareness of PMM; (5) involve women in the management of PMM, they are the primary local educators and motivators for future generations; (6)

Obura, D.O., Tamelander, J., & Linden, O. (Eds) (2008) *Ten years after bleaching - facing the consequences of climate change in the Indian Ocean. CORDIO Status Report 2008. Coastal Oceans Research and Development in the Indian Ocean/Sida-SAREC. Mombasa.* <http://www.cordioea.org>



Figure 2. Mohéli showing location of the marine Park.

inform law enforcement officials and members of the justice system to ensure understanding, respect and enforcement of PMM regulations.

INTRODUCTION

The Union of the Comoros is situated at the northern end of the Mozambique Channel, equidistant (approximately 300km) from continental Africa and Madagascar (Fig. 1). It comprises three volcanic islands: Grande Comore, Anjouan and Mohéli. The country is characterized by both high marine diversity and intensive anthropogenic pressure. This combination of attributes underscores the importance of assessing, understanding and monitoring socioeconomic elements to strengthen develop appropriate participatory management and conservation strategies.

The first Marine Protected Area (MPA) in the Comoros, Mohéli Marine Park (*Parc Marin de Mohéli - PMM*), was established on 19th April 2001 (Figure 2) as a major component of the UNDP/GEF-funded project 'Conservation of Biodiversity and Sustainable Development in the Federal Islamic Republic of the Comoros' (Project Biodiversity) (IUCN, 2004). The establishment of PMM was based on its rich biological

diversity and the presence of key coastal habitats and endangered marine species (see Ahamada et al., 2004 for a review of the ecological status of coral reefs in the Comoros). The Management Plan for PMM (Gabrie, 2003) anticipated full implication of local stakeholders through co-management. This approach has proved valuable when tackling fundamental socioeconomic factors influencing conservation efforts (Granek and Brown, 2005).

Initially regarded as a model for co-management of marine resources (IUCN, 2002), PMM is now operating at a vastly reduced capacity following the end of Project Biodiversity, and subsequent end in funding (Wells, 2005). Beaches are littered with poached turtle carcasses and fishers regularly use gillnets and other banned fishing methods (Abdou Rabi, pers. comm. 2006). It is thus crucial that the impetus of Project Biodiversity is built upon immediately to ensure that local communities do not become disillusioned and de-motivated. This study was recognized as essential to ensure integration of the perceptions of these stakeholders into current management decision-making and in the identification of future priorities.

Table 1. Positive and negative aspects of PMM identified by focus groups in approximate order of significance.

Positive aspects	Negative aspects
1. Environmental protection and a reduction in environmental destruction	12. Lack of sustainability
2. Increase in fish (size or number)	13. Lack of effective monitoring or enforcement
3. Prohibition of fishing gears	14. Lack of respect of PMM personnel for official agreements
4. Increase in environmental consciousness	15. Poor management of equipment
5. Ecotourism	16. Absence of PMM personnel
6. Increase in coral cover	17. No positive aspects
7. Exchange and increase in information through international interest	18. Prohibition of fishing gears
8. Infrastructure development	19. Lack of collaboration between PMM, external organizations and villages associations
9. Reduction in unemployment	20. Insufficient environmental training, education, and awareness raising
10. Official permission for villages to protect their coastal zone	21. Lack of management of forestry activities
11. Presence of ecoguards	22. False promises of Project Biodiversity
	23. Absence of female participation
	24. Lack of benefits
	25. Lack of motivation
	26. No visible zoning of PMM boundaries
	27. Inequitable distribution of benefits
	28. Environment in a worse state since the creation of PMM
	29. Lack of waste management

MATERIALS 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 further relevant questions were posed during each interview according to participants' responses to the key questions.

The interviews were carried out between 10th July 2006 and 20th August 2006 in the 10 villages of PMM: Miringoni, Ouallah 1, Ouallah 2, Ndrondroni, Nioumachoua, Ouanani, Kangani, Ziroudani, Hamavouna, and Itsamia (Fig. 2). The interviews were pre-arranged in each village by asking a

community leader to assemble two focus groups: one consisting of 10 men and one of 10 women of various ages, occupations, and social status. Male and female focus groups were held separately to ensure that women would feel at ease in voicing their opinions.

Whenever possible, interviews were conducted in private locations to minimize distractions and to ensure effective discussion. Discussion was usually in the local Comorian dialect, ShiMwali, with responses translated by a facilitator and recorded in French by the interviewer. The facilitator was briefed before each interview to ensure their understanding of each question and its purpose and to ensure that they did not make leading comments or prompt responses. Answers were repeated if necessary for clarification and accuracy.

RESULTS AND DISCUSSION

Achievements of PMM

'PMM's objectives are good in terms of conservation but they do not concretely address the issue of how we can both protect and consume resources within PMM.' - Man from Ouanani

All focus groups interviewed believed that PMM was important, citing the following reasons: (1) conservation of natural resources and the rich environment of Mohéli for future generations; (2) environmental education and awareness; (3) ecotourism development; (4) fisheries enhancement and food security; (5) protection of endangered species; (6) leverage of external funding (Table 1). These correspond closely to the MPA's initial objectives (Gabrie 2003): (1) to ensure the independent function and management of the park and to sustain the management structure; (2) to ensure the conservation of marine and coastal biodiversity, habitats and endangered species; (3) to encourage the development of ecotourism and other income-generating activities; (4) to ensure the sustainable use of marine resources; (5) to reinforce environmental education, training and communication. Thus, PMM has partially succeeded in creating awareness of its objectives and importance amongst local communities. However, the 18 negative aspects (Table 1) reported by PMM stakeholders illustrate that to date it has failed to some extent in successful implementation of these objectives in a co-management context.

Lack of Sustainability

Lack of sustainability was identified as the primary negative aspect of PMM (Table 1), although there were originally plans to address this issue, it seems that none was fully realized. 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 capitalisation than originally envisaged were required to set up the Fund (Wells, 2005). In the absence of the Trust Fund to cover the base

management costs of PMM, no contingency plan for sustainable funding and no lower-cost alternative for its management, PMM's financial situation was uncertain following the end of Project Biodiversity in 2003. This was clear to local communities who remarked on the reductions in management effectiveness, activity and levels of enforcement following the end of Project Biodiversity.

Alternative Livelihoods

'PMM told us that we could no longer use uruva (a poison) because it was bad, but in our village we saw the opposite happen, now there are less fish since it was banned!' - Woman from Miringoni.

Most focus groups (85%) believed that they had received no benefits or only one benefit from PMM. Thus, PMM has failed to provide adequate incentives to its stakeholders to ensure their continuing motivation for biodiversity conservation.

Ecotourism

Ecotourism was one of the key objectives of PMM (Gabrie, 2003) and was recognized by communities as a positive aspect (Table 1). However, tourist arrivals have declined since the creation of PMM 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, unpublished data).

Gear alternatives for fishers

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, PMM will be unable to win over fishers who have lost income following gear prohibitions.

Some villages respected regulations but felt that

their efforts were futile because fishers in other villages continued to use banned methods and benefit from higher catches. As a result, many fishers felt that they had not received adequate compensation to date, such as alternative sources of income or alternative fishing methods. 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 PMM, with any benefits (Loupy, 2001). Motorized boat donations have also proved inadequate and have caused conflicts in the villages involved.

There is a clear need to directly address these issues and provide realistic alternatives for these fishers. All fishers requested training in the use of alternative fishing gears. Women appeared to have been the most innovative in experimenting with new fishing methods (e.g. catching fish in baskets or *shiromanis* (traditional cloths) at low tide or using a hook, bucket, and wooden stick to catch octopus at high tide).

Inequitable Distribution of Benefits

A lack of transparency in the management of PMM and an inequitable distribution of its benefits were major concerns voiced by local communities (Table 1). Stakeholders felt that benefits were being concentrated in Nioumachoua, the headquarters of PMM or villages such as Itsamia that host more conspicuous marine attractions such as turtles. These views regarding distribution of benefits were a root cause of the ubiquitous feelings of resentment towards PMM. This dissatisfaction and distrust have clearly contributed to stakeholders' non-compliance with PMM regulations and their unwillingness to actively participate in effective co-management.

It became evident through focus group interviews and discussion with PMM staff that Ndrondroni and Hamavouna were the most socially and economically-marginalized villages within PMM as well as the most excluded from its activities. Unsurprisingly, they were also the two PMM villages most notorious for turtle poaching and a lack of compliance with PMM regulations, which was blamed on their Anjoanais

origin (Boinali, pers. comm. 2006). Furthermore, as both villages have poorer infrastructure and services when compared to the other eight villages, they are less likely to gain any direct benefits from tourism. As a result, if PMM is to function effectively as a whole, great efforts need to be made to equally include all villages and attempt to share benefits throughout the park.

It was also expected that there would be a lack of environmental awareness in Hamavouna and Ndrondroni as well as villages located further from the coast or the PMM headquarters but this was not so. Women in Itsamia and Nioumachoua were classified as having no awareness of PMM. This was unexpected since PMM headquarters, PMM's technical staff and two ecoguards are located in Nioumachoua. Itsamia is the only other village with more than one ecoguard and is known throughout the Comoros as a pioneering village in terms of turtle conservation and its dynamic village association, ADSEI. The lack of awareness in these villages could be because (1) less emphasis was placed on environmental education as it was assumed that information would be automatically disseminated through the physical presence of PMM personnel or (2) because of the strong PMM presence, less effort was made to develop community co-management since PMM personnel were expected to directly take on these responsibilities.

Exclusion of Women

'We know nothing about PMM except for the activities that are now prohibited and the names of the PMM personnel that work here – we don't even know what these personnel do.' - Women of Nioumachoua.

Participation of women in coastal resource use is rarely appreciated and tends to receive little, if any, economic remuneration (Van Ingen et al., 2002). Great disparity in knowledge and awareness of PMM was noted according to gender, with women showing much lower levels of awareness (Fig. 3). The vast majority of women (in 70% of villages) felt that they had not played any role in the creation of PMM and four female focus groups also remarked that they

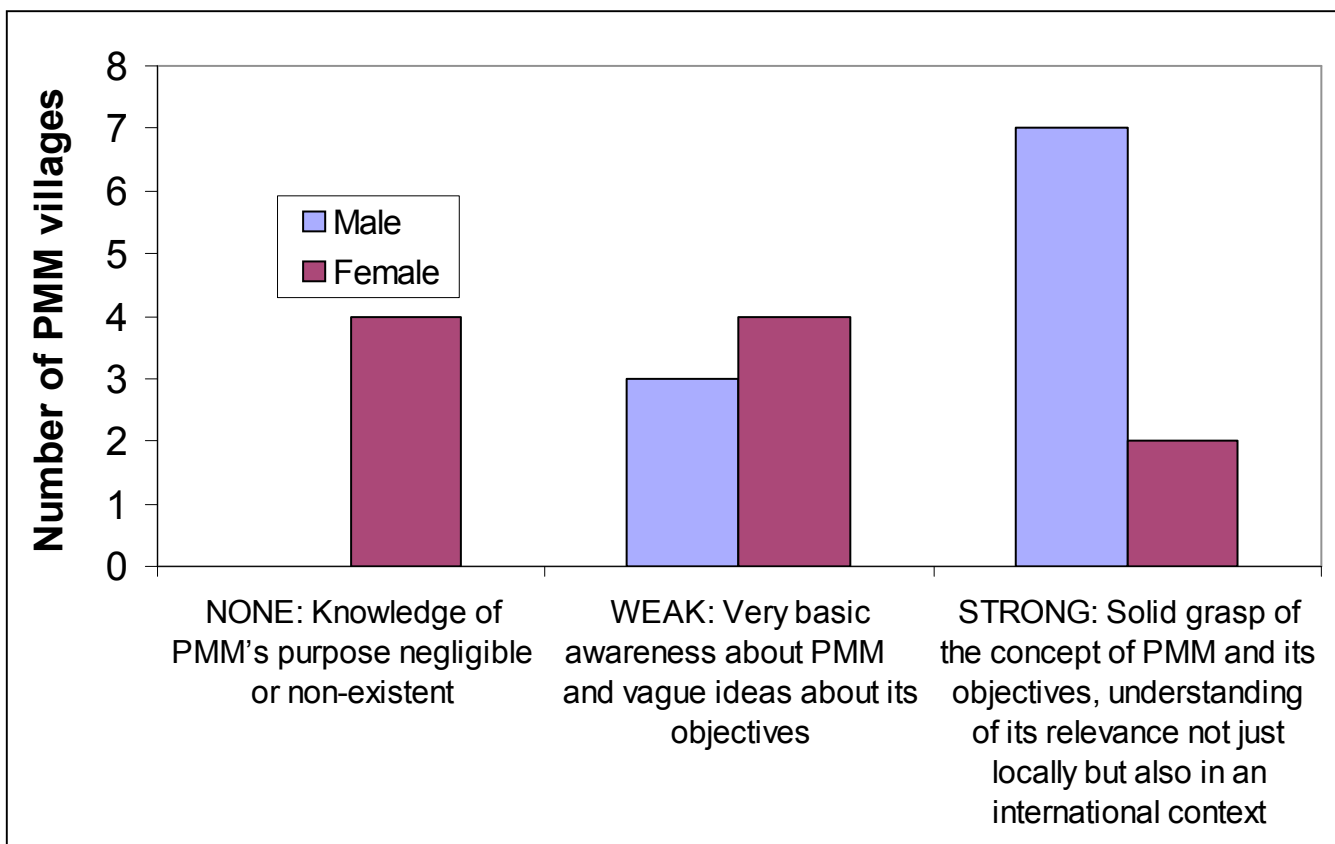


Figure 3. Stakeholder awareness of PMM in male and female focus groups.

remained uninformed and ignorant of park activities as well as conservation in general. In spite of this, the women who participated in the focus group interviews were motivated and inspired; they were eager for training in all conservation activities, including nightly surveillance of beaches for turtle poachers.

Environmental Threats

Turtle poaching

Turtle poaching was the most commonly cited threat within PMM (Fig. 4). Communities felt that poaching of endangered species was a serious problem and had a negative impact on the environment and tourism. The motivation behind hunting turtles for meat was for its taste, low cost, and because consuming turtle meat is believed to bestow strength.

Destruction of coral and octopus fishing

The destruction of coral was also regarded as a significant problem within PMM (Fig. 4). This was an issue often raised by female focus groups, as it is more common for women to collect octopus or other marine species at low tide (a fishing technique known locally as *mtsohozi*), thus they directly witness impacts on coral. Coral damage was frequently identified as a result of octopus fishing practices; particularly through the use of iron rods (*ntshora*) or rocks to smash coral and extract the octopus. While the use of iron rods was not officially banned under PMM regulations, it has been regarded as an infraction as a form of spearfishing (Loupy, 2001).

Walking on coral at low tide was identified as another cause of destruction. Some groups also noted the collection of coral for construction, although this

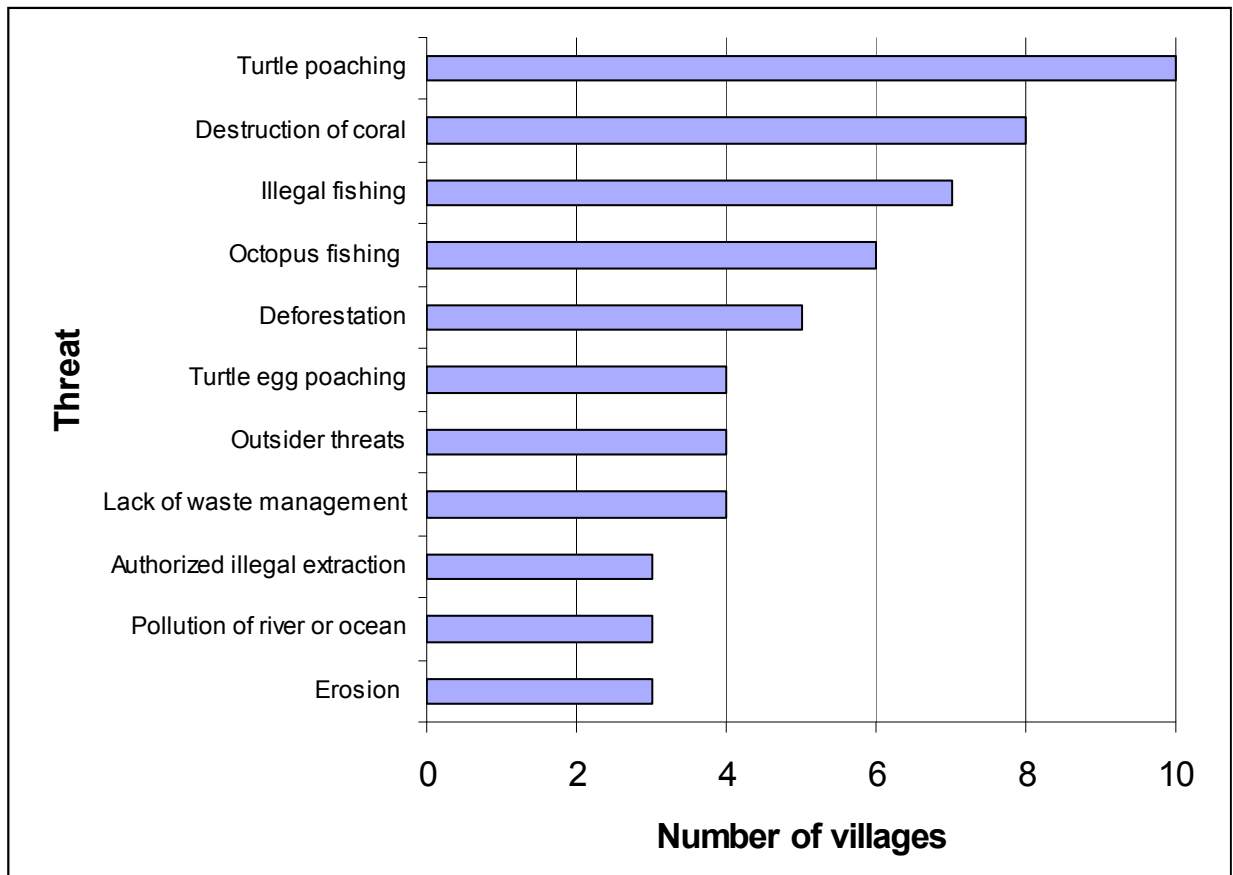


Figure 4. Environmental threats identified during focus group interviews in order of priority.

has been less frequent in recent years. The men of Ndrondroni claimed that before PMM, they mined coral and it grew back quickly; but now it does not return. The source of these perceptions could be the 1998 coral bleaching event which resulted in severe levels of mortality throughout the Indian Ocean (Obura, 2001).

Illegal fishing

Although knowledge of the prohibitions on fishing methods was widespread throughout PMM, stakeholders from the majority of villages (70%) stated that the use of prohibited fishing gears continued to be a problem within PMM (Fig. 4). These methods were used openly, in hiding, and/or by fishers from neighbouring villages. Many focus groups were

particularly concerned with the damaging effects of gillnetting, such as coral damage and by-catch. The authorization of gillnetting within PMM during the month of Ramadan in 2005 caused conflict and radiated mixed messages; some men stated that they felt that this authorization negated their conservation efforts. Many fishers also remarked that they have never been aware of the location of the PMM no-take zones and that PMM personnel did not enforce these zones.

Deforestation

Deforestation, the fifth most important concern, (Fig.4) was considered a result of cultivation practices that involve felling large numbers of trees and swidden agriculture. Erosion was recognized as the most

damaging result of deforestation, leading to sedimentation and damage to coastal habitats such as seagrass and coral reefs, particularly during periods of high rainfall. Deforestation of mangroves was not cited as an extensive problem on Mohéli since mangrove wood is not widely used. Communities also expressed fear of mangrove areas because of evil spirits.

Monitoring and Enforcement

'The fishermen here are doing poachers a favour by protecting the turtles so that they can come here to kill and eat them' – a Nioumachoua fisher.

Lack of effective monitoring or enforcement ranked second for negative aspects of PMM (Table 1). This issue was raised in 8 villages where respondents stated that the lack of permanent monitoring and enforcement was leading to a continuation of turtle poaching and destructive fishing practices. As a result, local communities have become de-motivated. Resentment has arisen from the fact that those that do respect regulations gain no benefits, while those that do not respect regulations gain increased benefits. Lack of enforcement has also led to the perception that PMM no longer exists and thus, people may carry out illegal activities with no fear of incrimination.

CONCLUSIONS AND RECOMMENDATIONS

The objectives of PMM were clearly envisaged, although their implementation has not yet been fully realized. PMM must act urgently in order to realign its management activities and re-establish itself as an effective MPA. The most pressing points of action identified by this study are:

(1) ensure sustainability through effective financial planning and promotion of low-cost, appropriate management techniques

An effective business plan and trust fund or other means of sustainable finance should be developed and there is a need to move away from external funds, and focus on low-cost, appropriate management that can continue if there are financial problems in the future

(2) mobilize local communities to create a truly co-managed PMM

All decisions are currently being made by one or two people who are not representative of PMM communities; the Management Committee must be fully involved and their power of authority reinforced as representatives of the 10 villages for decision-making in PMM.

(3) ensure tangible benefits to local communities through realistic alternative livelihood options, particularly for fishers.

A frame survey and socioeconomic assessment of fisheries are essential first steps, followed by research and implementation of alternative gears and livelihoods.

(4) ensure equitable sharing of benefits and awareness of PMM

An initial focus on Hamavouna and Ndrondroni is required, involving an intense awareness-raising and education programme to instil a new understanding in these communities for their natural resource and ecotourism benefits must be equally distributed.

(5) involve women in the management of PMM, they are the primary local educators and motivators for future generations

This may be achieved through targeted awareness raising programmes, training of female ecoguards, ecoguides and community trainers and promotion of sustainable alternative livelihoods for women (from artisanal craft-making to new fishing methods).

(6) inform law enforcement officials and members of the justice system to ensure understanding, respect and enforcement of PMM regulations.

Targeted training workshops in the ecological and economic importance of natural resources will help to ensure the effective application of environmental regulations, particularly through the community reward system for the reporting of PMM infractions.

'We want youth to be involved with PMM. We want them to become motivated and to forget about all the past negative aspects associated with PMM. We want them to be able to gain the benefits. Our generation has failed, but we should look to improve

the situation for the following generations.’ – Man from Ndrondroni

ACKNOWLEDGEMENTS

This study was part of the project: Operation Mohéli: Linking Conservation of Marine Flagship Species with Sustainable Development, supported by a Future Conservationist Award from the BP Conservation Leadership Programme and conducted by C3 in collaboration with PMM and AIDE. Thanks are due to the following for their input and support: the communities of Mohéli, especially those individuals who assisted with organising focus groups and translation; the ministries responsible for the environment of the Union of the Comoros and Mohéli, particularly Abdou Tchake and Toiouilou Madi Bam Dou; Kamardine Boinali, curator of PMM and the PMM ecoguards; the PMM management committee, particularly Abdou Malida and Nassur Ahamada and Delphine Malleret-King of CORDIO East Africa for comments on this report.

REFERENCES

- Ahamada S, Bijoux J, Bigot L, Cauvin B, Koonjul M, Maharavo J, Meunier S, Moine-Picard M, Quod J-P, Pierre-Louis R (2004). Status of the Coral Reefs of the South West Indian Ocean Island States. In Wilkinson C (ed.) Status of Coral Reefs of the World: 2004 Volume 1. Australian Institute of Marine Science, Townsville, Queensland, Australia. Pp 189-212.
- Bayon R (1999). An Environmental Fund for the Comoros: Issues and Options. Report of Feasibility Study Conducted in Grande Comore and Moheli, Nov. 7-16, 1999. Pp 40.
- Bunce L, Townsley P, Pomeroy R, Pollnac R (2000). Socioeconomic Manual for Coral Reef Management. Australian Institute for Marine Science, Townsville, Queensland, Australia. Pp 251.
- Gabrie, C (2003). Programme d’Amenagement du Parc Marin de Mohéli. Projet Conservation de la Biodiversité et développement durable aux Comores PNUD/GEF COI/97/G32/A1/1G/99. Pp 80.
- Granek, EF, Brown, MA (2005). Co-Management Approach to Marine Conservation in Mohéli, Comoros Islands. Conservation Biology 19: 1724-1732.
- IUCN (2004). Projet Conservation de la Biodiversité et Développement Durable aux Comores PNUD/GEF COI/97/G32/A/1G/99. Rapport final du Projet. Pp 42.
- IUCN (2002). Mohéli Marine Park, The First Protected Area in the Comoros and Equator Initiative Finalist. Pp 2. http://www.iucn.org/en/news/archive/2001_2005/press/mohelinp.pdf
- Loupy S (2001). Les Pecheurs de Nioumachoi et Le Parc Marin de Mohéli. Rapport de stage dans le cadre du DESS Pratiques sociales du developpement, Institut d’etudes sur le developpement economique et social (PARIS I). Projet de conservation de la biodiversité et développement durable aux Comores PNUD – FEM. Pp 71.
- Obura D (2001). Coral Reef Bleaching and Monitoring in the Indian Ocean. In: Coral Bleaching and Marine Protected Areas. (Ed. R.V. Salm & S.L. Coles). Proceedings of the Workshop on Mitigating Coral Bleaching Impact Through MPA Design, Bishop Museum, Honolulu, Hawaii, 29-31 May 2001. Asia Pacific Coastal Marine Program Report # 0102, The Nature Conservancy, Honolulu, Hawaii, USA. Pp 82-96.
- Van Ingen T, Kawau C, Wells S (2002). Gender Equity in Coastal Zone Management: Experiences from Tanga, Tanzania. IUCN Eastern Africa Regional Programme Tanga Coastal Zone Conservation and Development Programme. Pp 36.
- Wells S (2005). Assessment, Synthesis, and Gap analysis of Existing and Planned Activities in the Coastal Zone Countries of the Agulhas and Somali Current Large Marine Ecosystems (ASLME). Report to the Wildlife Conservation Society. Pp 92.