

**INTERNATIONAL CORAL REEF ACTION NETWORK: MALINDI
WATAMU MPA COMPLEX DEMOSTRATION SITE PROJECT**

FINAL REPORT

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FINAL REPORT (2004)

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SUMMARY

Overall, the project was able to make good progress towards meeting its objectives. The objective of profiling the MPA complex was completed through three major assessments. In particular, a management profile (Muthiga and Weru 2002: Annex 1), a biophysical profile of the coral reefs of the MPA (McClanahan 2002:Annex 2) and a land use profile of the project area (Nzuki 2003:Annex 3) were completed. In addition, a study was carried out on the potential of the parks as replenishment areas (Kaunda-Arara 2002: Annex 4). These assessments have increased the knowledge of the area and have underscored the key issues and challenges for management. Apart from the socio-economic profile that was completed during the profiling an additional socio-economic assessment of the capacity of Malindi boat operators (Muthiga et al 2003:Annex 5) has also increased knowledge of one of the key stakeholders of the MPA complex and the limitations on the ability to increase benefits from the MPA complex. An assessment of management effectiveness of the MPA complex was also undertaken as part of a regional project (Wells, 2003 and Muthiga 2004) that included a detailed review of the current management plan of the MPA hence contributing to meeting part of the fourth objective.

Several activities were completed in order to demonstrate small infrastructure developments for the MPA as well as for communities whose livelihoods depend on the MPA. These included rehabilitation and construction activities as well as repair and replacement of essential equipment for monitoring. Activities under this objective included refurbishment of the Malindi MPA resource and training center as well as the information center in Malindi, construction of an information hut for the Watamu Marine Park and rehabilitation of the Malindi workshop. In addition, a boat engine room and office were constructed for the Malindi and Watamu boat operators. Through these activities, the MPAs and the community boat operators were able to increase their ability to manage and benefit from the MPA. Several training and awareness activities were completed and the project and findings from the assessments were reported at a number of international forums including ICRI, ITMEMS, ICRS and the World Parks Congress.

The following report details the activities that were carried out, constraints to meeting project objectives and outlines recommendations for improved management of

the Malindi-Watamu MPA complex. Overall, the demo activities have not only contributed to the improved management of the Malindi-Watamu MPA complex, but have also contributed to enhancing the capacity of key MPA stakeholders as well as raising the profile of the area as a demonstration of ways to improve MPA management in the Western Indian Ocean region. However, the project has also led to the recognition that much more needs to be done to increase the long-term sustainability of the MPA and hence benefits to the stakeholders.

In summary, the project has served to strengthen the management of Malindi-Watamu MPA complex, has built the capacity of local communities to enhance their ability to make use of the benefits of the MPA complex and contributed to global knowledge on MPA management in general and the management of the Malindi-Watamu complex in particular.

1. BACKGROUND

The Kenyan coast has a wealth of marine and coastal ecosystems including coral reefs and associated ecosystems such as seagrass beds and mangrove forests that are crucial for the livelihoods of coastal people and for the Kenyan economy. Coral reefs provide food and income to coastal communities, as well as other goods and services of strategic importance to the national economy including, tourism, fisheries, and coastal protection (UNEP et al. 2000; Muthiga et al. 2000). Coral reefs, mangrove forests and seagrass beds however are facing many threats from human activities including overexploitation and destructive exploitation of living resources, pollution, sedimentation, unplanned tourism and urban development (UNEP et al 2000). It is projected that these impacts are likely to get worse in the future due to increased human population growth leading to increased pressure on marine resources as well as climate change impacts such as bleaching (McClanahan et al. 2001).

The Kenya government through the Kenya Wildlife Service (KWS) has partially been addressed the issues of marine resource exploitation on the Kenyan coast by gazettelement of Marine Protected Areas (MPAs). There are 4 marine parks managed as no-take areas and 6 marine reserves where traditional fishing methods is regulated

(Muthiga 1998). The use of marine protected areas has proven successful in the preservation of biodiversity and fisheries management in many parts of the world (Bohnsack 1993; Roberts and Polunin 1991) and Kenya is no exception. Studies show a higher diversity and abundance of key species in marine protected areas in Kenya than outside MPAs (McClanahan 1996) indicating the importance of these areas as refugia and supply of larvae to adjacent fished areas (Kaunda-Arara and Ross 2004). Results also show that protection of reefs in Kenya has led surprisingly rapidly to increases in finfish numbers and sizes as well as a reduction in sea urchin biomass (McClanahan and Arthur 2001).

Unfortunately, despite the proven potential of protected areas in biodiversity conservation and fisheries management, conflicts between the local community and MPAs have not been completely eliminated. Studies have shown that one of the ways to address user conflicts is to work closely with stakeholders to increase the sharing of potential benefits derived from MPAs. The KWS has established a department the Community wildlife department whose major objective is to address issues of communities living adjacent to protected areas. The department achieves this objective partly through support of enterprise projects supported by partners. In 2001, the Malindi –Watamu MPA complex (Fig 1.), one of the oldest MPAs in Africa (Malindi Marine park was established in 1969) was selected as a Demonstration site under the International Coral Reef Action Network (ICRAN) East African project component. An ICRAN project was initiated through the United Nations Environment Program (UNEP) in this MPA with the objective of profiling the MPA complex, developing small-scale infrastructural developments to enhance management, and reviewing socio-economic issues of stakeholders. The following report details the activities that were supported under this project. The project was administered by the KWS coast region office under the research and planning unit and implemented by the Wardens Malindi and Watamu and stakeholders of the MPA complex.

2. PROGRESS

The following section details activities that were undertaken under each objective.

2.1. Objective 1: Profiling

The Profiling exercise was carried out through a series of assessments and studies detailed below.

2.1.1 Status and Management of Marine protected Areas in Kenya: A case study of the Malindi-Watamu MPA complex (Muthiga and Weru 2002)

A comprehensive assessment of the management of MPAs in Kenya and the specific issues of the management on the Malindi-Watamu MPA complex are detailed in a report (Muthiga and Weru 2002). Relevant issues including the significance of the MPA nationally, management strategies and policies and legislation are detailed and analyzed with a view of elucidating issues that need to be addressed for the future sustainability of the MPA complex. Important challenges for management included financial sustainability of the Kenya Wildlife Service, administrative and managerial stability stakeholder collaboration and integration of management activities with other national and regional institutions. Several recommendations for management are detailed in the report but the key ones include:

- Ensuring that trained personnel are retained at the MPA
- Review of the management plan to include measurable objectives and regulations
- Harmonization of policies with key sectors including fisheries and forestry and legislation of regulations specific to MPAs
- Including MPAs in a larger framework of integrated coastal management

2.1.2 The Recent Ecological History and Condition of the Malindi-Watamu Reef Complex (McClanahan 2002)

The Malindi Watamu MPA complex has received a great deal of attention from researchers and students over the years (McClanahan 2002). A comprehensive biophysical assessment of the coral reefs of the MPA complex was carried out based on the annual monitoring program of the Coral Reef Conservation Project (CRCP). The

assessment included information on benthic cover (hard and soft coral, fleshy algae, seagrass, algal turf and calcareous and coralline algae, sponge and sand), fish biomass and diversity, invertebrate (sea urchins) biomass and diversity as well as gastropod abundances and diversity. In addition ecological processes including predation and herbivory are assessed. Results summarized in the report (Annex 2) indicate that the reefs of the marine parks have high coral cover, a high diversity of hard corals and fish and, low numbers of sea urchins, indicating healthy reefs. However, the single most important impact on the reefs of the Malindi and Watamu was the bleaching event of 1997-1998 that caused high levels of coral mortality (McClanahan et al 2001). Recovery is variable and depends on the reef but is particularly slow in Watamu. The biophysical assessment report recommends the need to carry out further studies to increase the knowledge of other ecosystems and processes in the MPA complex including:

- A broad survey of the ecology and habitats of the reef complex, particularly in the reserve area including all reef zones since studies have focused on lagoon areas
- A survey of the fishery and fishing practices in the reserve and the surrounding park-reserve area with particular focus on the marine reserve, adherence to reserve policies and the historical changes in fishing effort and catches.
- A study of the factors influencing fleshy algal growth in Watamu including nutrient inputs, water motion and residence time and the possible effects of land development programs on nutrients inputs and dynamics.
- Implementation of a moderate-scale reef restoration activity in Watamu examining manipulations of herbivory, corals, and algae.
- Increasing the education and policing of marine ornaments as well as further studies of tourists effects such as fish feeding and trampling of corals.

2.1.3 the land use patterns of the Malindi-Watamu area and other potential threats to the marine environment (Nzuki 2002)

The environmental pressures that impact the MPA caused by the development activities in the Malindi area are detailed in a GIS based report on the changes in land-use practices since the establishment of the MPA in 1969. Results indicate that urbanization and coastal development especially from the tourism and agricultural sectors contribute to

increased degradation of the marine environment in the area. Removal of forests and natural vegetation for agriculture, removal of mangroves for building and fuel and fishing to meet the demands of a growing urban population all contribute to increased threats on the marine ecosystems of the MPA including coral reefs, mangrove forests and seagrass beds. The report recommends a land-use plan that is incorporated into the MPA management plan that takes into consideration issues of coastal erosion destruction of habitats for marine species including marine turtles and shorebirds as well as improved enforcement of existing land-use statues such as construction setbacks.

2.1.4 The influence of marine reserves on biodiversity conservation and adjacent fisheries in coastal Kenya (Kaunda-Arara 2003)

A study of the migration of fishes in the marine parks to adjacent marine reserves was undertaken to assess the role of the Malindi and Watamu parks to enhance fish stock recovery in adjacent reserve areas. The study that was mainly supported by the Wildlife Conservation Society (WCS) received some additional funds from the project. Results indicate that fish spillover into the reserve is minimal for many species although spillover is greater off fringing reefs than patch reefs. The study increases the knowledge about the effects of fishing in the marine reserves and gives a strong management rationalization for protection of coral reef fish within no-take areas since fish are rapidly caught in reserves as well as suggestion for fisheries management and zoning in marine reserves. The study contributed to a publication (Kaunda-Arara and Ross 2003) that was presented at the Second WIOMSA Scientific Symposium.

2.2 Objective 2: Small scale infrastructure developments

2.2.1 Infrastructure developments in Malindi and Watamu Marine Parks

The project contributed a substantial amount of funds to the refurbishment of the Malindi resource and training center. This included repair of the resource lecture room and library to accommodate more students as well as construction of self contained bandas that has increased the accommodation facilities to house up to 24 participants. In

addition, an ablution block was rehabilitated for use by day visitors. The training facility is utilized by schools (primary, secondary and local universities), government departments (for meetings and conferences) and researchers. In addition, some international courses including the East African Wetlands management course and the African wetlands management course that are coordinated by the KWS Naivasha training institute, are regularly held here. Recently, training in the ReefCheck monitoring methodology and the WIOMSA regional MPA management course were held at the training center.

The KWS/Netherlands Wetlands Conservation and Training program supported construction of the information center in Malindi. However, the center required refurbishment of the roof, construction of a ticket office next to the center thus attracting visitors to the center. A TV was also purchased to facilitate student visits and the ticket office was secured. In Watamu, an information hut complete with awareness materials and a TV was constructed. These information centers have become very popular and receive up to 100 schools and hundreds of local and international visitors a year. Additional infrastructure developments in the MPAs included rehabilitation and repair of boats and engines, dive equipment and moorings. Damaged dive equipment was replaced increasing the ability of the MPA to carry out monitoring and surveillance activities.

Overall these activities greatly increased the capacity of the MPA to implement daily management actions. However the sustainability of these activities are uncertain due to the unstable financial stability of the KWS. Recommendations from this activity include:

- Support for further development of the Watamu park base. The base is poorly equipped for communication as well as for monitoring activities. Lack of a computer and adequate office space has greatly constrained the ability of the management staff to run scientific and awareness activities.
- Support for additional equipment since despite repair and rehabilitation of boats and engines, the latter are quite old and require a great deal of high cost maintenance. Their replacement is crucial to guarantee the continuation of key activities in the MPAs, including monitoring, surveillance and safety.

2.2.2 Community infrastructure developments

Several infrastructural developments were completed including structures for the boat operators in the MPA complex as well as a bird-hide in Mida creek. Support was provided by the project for the expansion of the Malindi boat operator's engine storage facility. The engine room is utilized by boat operators for storage as well as repair, up to 40 engines were stored in a very small space making it difficult to store and use engines daily. Expansion to double the size of the room, provision of shelving and supports for the engines, provision of some tools, repair of the roof of the entire building as well as repairs of the office and community shop were completed under the project. In Watamu, where previously no engine room existed, construction of a storage space beneath the current offices of the Watamu boat operators association was completed. In addition, the boat repair workshop in Malindi was repaired and will be available for use by the local boats greatly reducing costs for storage and repair at the current boat yard in Malindi.

Overall these activities will enhance the ability of the boat operators to carry out their daily work related activities including maintenance hence reducing the costs of running their businesses. This was supplemented by training some of the coxswains of the MPA complex in engine repair and maintenance. Recommendations from the activity included training to improve collection and collation of information including numbers of visitors utilizing each boat, maintenance schedules and revenue collected by the associations. In addition, commitments made by the community to contribute to the project through provision of appropriate furniture and shelving for the office and shop need to be met.

Support was also provided for construction of a bird-hide in Mida creek as part of a UNDP small grants project that included construction of a mangrove boardwalk to the creek. The project is coordinated by Aroca Kenya an NGO that works with the local communities in Malindi district to support environment projects that are eco-tourism based. The bird-hide was constructed as a final stop along the boardwalk and is attracting many international bird watchers. The project benefits the community through collection of revenue from visitors who use the boardwalk and bird-hide. The funds that are collected support management of the boardwalk, local community guides and a bursary

fund for local students. The project demonstrates how conservation can benefit local communities and has a high level of support from communities and the local administration. It has been recommended further support is needed for the Mida-Creek community boardwalk to increase visitor safety along the boardwalk. An expansion of the boardwalk concept to other sites along the creek would enable the generation of additional revenue for adjacent communities.

2.3 Objective 3: Review of Socio-economic status of boat operators

2.3.1 An assessment of the capacity of the community boat operators in the Malindi marine park and reserve (Muthiga et al 2003)

At the initiation of the project, a stakeholder profiling exercise was conducted, the Malindi boat operators were identified as the community with the longest association with MPAs in Kenya, yet receiving the least support from donor funded projects that are implemented by KWS in MPAs. An assessment of the Malindi local boat operators was carried out to establish the capacity of the boat operators to manage their businesses and identify gaps in skills as a first step towards developing initiatives for assisting the boat operators to become more self-sufficient. The assessment report details the findings of the exercise and recommends the following:

- a) The establishment of a revolving fund that can be utilized for maintenance and development costs for the boat operators
- b) Increasing the capacity of boat operators through training in small business management, interpretative and marine guide skills and visitor handling. The officials of the association should also receive training in leadership
- c) Enhancing the ability of boat operators to increase business through marketing. This can be addressed through production of marketing materials including brochures and fliers to be posted in hotels and tourism offices, as well as hosted at easily accessible websites.

- d) Enhancing the quality of the service provided by the community boat operators by ensuring serviceable boats and engines through improving skills and providing essential equipment on board (life rings, masks, snorkels, life jackets, First-Aid kits).
- e) Supporting the harmonization through arbitration of the two boat operators associations into a single association. A field trip to Mombasa to meet with the Mombasa boat operators association (MBOA) that has gone through a harmonization process should increase willingness among the Malindi boat operators to form one association.
- f) Supporting the development of an investment plan to cater for the low season when business is slow.
- g) Supporting the development and implement a monitoring and evaluation plan that includes tracking revenues, compliance to regulations and maintenance of standards. Results should be communicated to the association and hotels hence improving willingness of hotels to collaborate with the Malindi boat association.

The socio-economic assessment report was used to support the development of a proposal for funding under the UNDP Small Grants Program. The proposed project will support the strengthening of the capacity of the Malindi boat operators, and is due to commence in the next few months.

2.4 Objective 4: Education and awareness

2.4.1 Education and awareness infrastructure

The project supported a number of activities to enhance the ability of the MPAs to meet one of the stated objectives of the MPA, to increase awareness as outlined in the Management plan. Details of these activities are outlined under the section of infrastructure developments (2.2.1).

2.4.2 Training activities

Activities that were undertaken under this objective included training of MPA and community boat operators in boat engine maintenance, maintenance of dive equipment and mooring maintenance. At the inception of the project, the Warden Malindi was invited to attend an MPA management effectiveness workshop organized by IUCN and WIOMSA on the recommendation of the project. The skills learned during this workshop greatly enhanced the ability of the management to appreciate and utilize appropriate management information. The small library that was established in the resource and training center increased the ability of students on attachment to learn about the marine environment and the MPA. Park rangers have also received training in water quality assessment from the KMFRI and ReefCheck coral reef monitoring.

A major training activity that was undertaken at the Malindi resource and training center was the Regional Management effectiveness assessment exercise. The project was implemented by IUCN and funded by NORAD and ICNAN. All of Kenya's managed MPAs were involved as well as MPAs from Tanzania and Seychelles. The managers received training in the concept and methodology of MPA management effectiveness assessment and carried out a baseline assessment of their MPAs. The findings of the regional assessment have been published (IUCN 2004) and were presented at the World Parks congress and the 10th International Coral Reef Symposium (ICRS) in Okinawa. Since the Kenyan MPAs are the first to carry out a countrywide assessment in the region, the experiences will be captured in a national report for Kenya that is currently being produced by N. Muthiga (WCS).

In addition to the training activities undertaken by the project, the Malindi resource center has attracted several regional and international training programs including the East African Wetlands management course, the Regional MPA management course conducted by WIOMSA and, the regional training in ReefCheck. In addition, the project has been presented at several international fora including the International Coral reef Initiative (ICRI) meetings, the International Tropical Marine Ecosystem Symposium (ITMEMS; Annex), the World Parks Congress and, the 10th ICRS. Additional publications from the project include

3. OPPORTUNITIES AND CHALLENGES

The project experienced some challenges that slowed down the implementation of some activities. For example, at the beginning of the project, communities had a very high expectation due to the public relations exercise of the global ICRAN project and the mention of large amounts of funds. The communities naturally wanted direct control of the funds and were not aware that the actual amount allocated to the Malindi-Watamu demonstration project was not as high as expected. The Malindi Fishermen's Cooperative Chairman even met with KWS and indicated he would not support the project if funds were not directly disbursed to the community. However, after a number of meetings were held to explain the details of the project, communities were more accepting of the project and a letter of support was given to the Warden from the Area chief in Malindi.

An additional constraint that had a major impact on the project was the frequent redeployment of KWS staff. For example, the Wardens who were at Malindi and Watamu on initiation of the project were both transferred to other protected areas in Kenya. Unfortunately, the new Wardens did not have a background in Marine issues, however, fortunately, the Regional MPA managers training course conducted by WIOMSA was held in Malindi during the life of the project and both new Wardens were trained. Rangers were also transferred and this had the overall impact of slowing down implementation of activities but also led to loss of institutional knowledge about the project and loss of skills that had been developed during the project. In addition, both marine scientists at the KWS coast regional office who had oversight responsibility for the project also left KWS within months of each other, further causing difficulties for the project. The stability of senior management within KWS although not directly impacting the project has implications for the future sustainability of MPAs in Kenya. During the life of the project, the KWS has changed ministries three times and the Directors and the board have also been changed. This has the effect of destabilizing the institution and hence has implications on implementation of project activities.

The MPA is also impacted by external factors including the global threat on tourism that the MPAs and KWS depend on for much of their revenue. Financial stability is an issue that if not addressed will have serious implications for protected areas in Kenya in general and MPAs in particular. In addition, political instability including

the Likoni clashes had a negative impact on visitor numbers further causing reduction in revenues. The effects of 1997/1998 bleaching event has also shown how global events can impact coral reefs at a local level. All these are factors that the management of MPA have no direct influence. At the local level, the institutional arrangements, especially fishing and forestry activities in marine reserves, are a challenge for MPAs. This is particularly a challenge for the Malindi-Watamu MPA complex that has such a large marine reserve, and the Mida creek mangrove forests. The various assessments have individual recommendations but the following areas need urgent attention:

- **Capacity building:** Lack of skills at both the park and community level reduces the impact of management and the capacity for the MPA absorb and adapt to new changes and knowledge. For example, park personnel are poorly trained in the search for, maintenance and use of information. Except for the Wardens, most of the park staff are computer illiterate including use of the internet. The communities had even less capacity in many aspects of management including in languages, in computers, in visitor handling and management of their businesses. This lack of capacity reduced their competitive abilities hence their ability to improve their economic status.
- **Targetted research for management:** a great deal of baseline information and trends on the coral reefs of the areas is available. A review of this information needs to be carried out (see recommendation in 2.1.2) with a view to identifying gaps and designing research programs for management to feed into an adaptive management process
- **Review of the management plan:** The project carried out an assessment of the management plan and indicated the major areas of concern (section 2.1.1). The plan needs a participatory review and revision and adoption at the institutional and district level.
- **Institutional linkages:** conflicts amongst management sectors can be greatly reduced through development of linkages and consultative processes. This could be further enhanced if outlined in the regulations within the environmental.

- Institutional stability: The financial and administrative stability of KWS is of great concern. Although this cannot be directly addressed at a project level, national attention needs to be increased to address this challenge.

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- Kaunda-Arara, B and G. Rose 2004. Effects of marine reef National Parks on fishery CPUE in coastal Kenya. *Biological Conservation*, **118**: p. 1-13.
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- Muthiga, N. and R. Njue. 2003. Implementing ICRAN activities at the Malindi/Watamu MPA complex demonstration site, Kenya. 6pp

Muthiga, N. and Weru, S. 2002. Status and Management of Marine protected Areas in Kenya: A case study of the Malindi-Watamu MPA complex. KWS report.

Nzuki. S. 2002. The land use patterns of the Malindi-Watamu area and other potential threats to the marine environment. KWS report.13pp.

List of Annexes

Annex 1: Report by Muthiga and Weru (2002). Status and Management of Marine protected Areas in Kenya: A case study of the Malindi-Watamu MPA complex

Annex 2: Report by McClanahan (2002) The Recent Ecological History and Condition of the Malindi-Watamu Reef Complex

Annex 3: Report by Nzuki (2002) The land use patterns of the Malindi-Watamu area and other potential threats to the marine environment

Annex 4: Report by Kaunda-Arara (2002) The influence of marine reserves on biodiversity conservation and adjacent fisheries in coastal Kenya

Annex 5: Report by Muthiga, N., S. Weru, A. Tuda. (2003). *An assessment of the capacity of the community boat operators in the Malindi marine park and reserve*

Annex 6: Muthiga, N. and R. Njue. 2003. Implementing ICRAN activities at the Malindi/Watamu MPA complex demonstration site, Kenya.

Annex 7: Financial report

Annex 8: First progress report