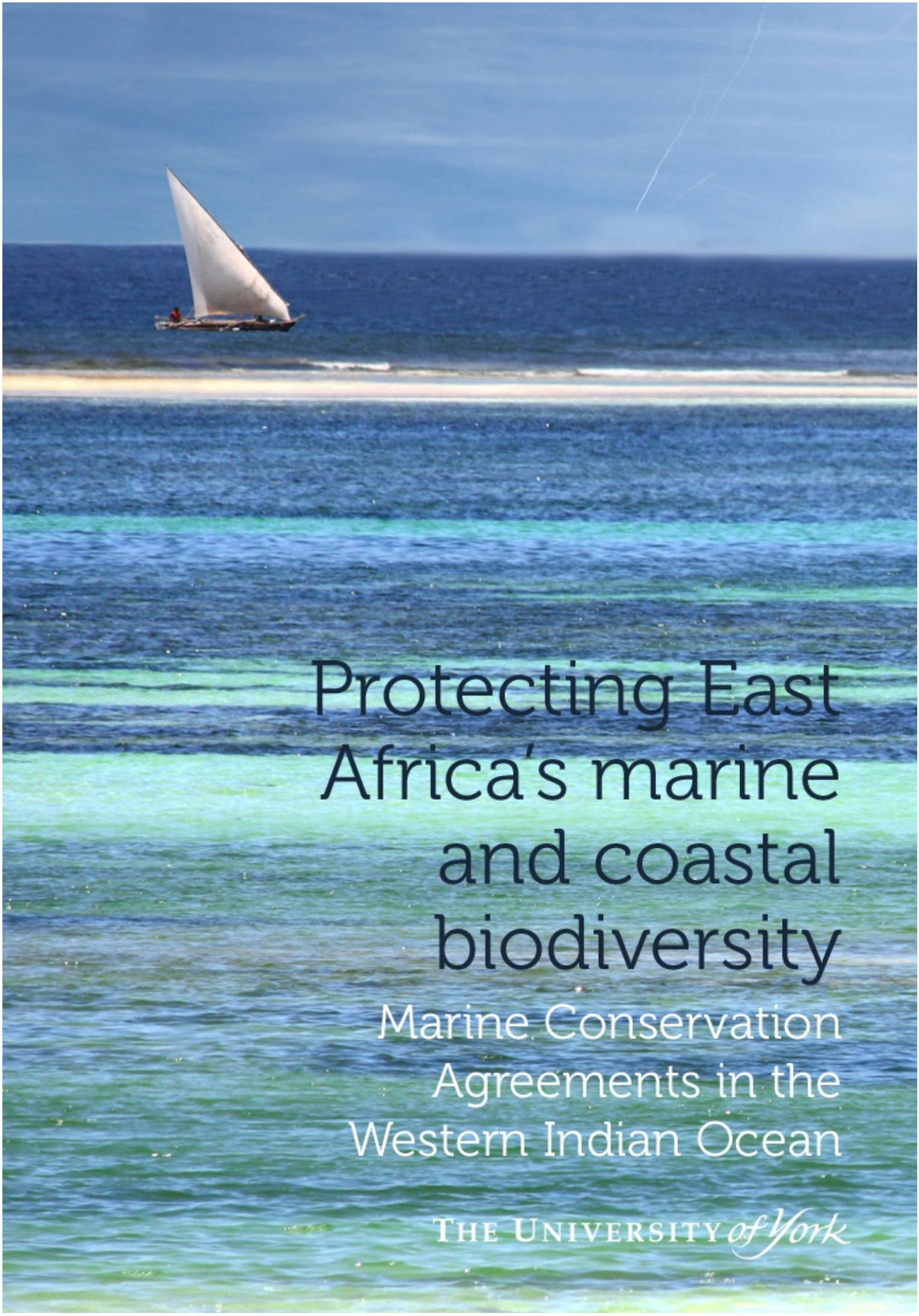

Protecting East Africa's marine and coastal biodiversity

Marine Conservation Agreements in the Western Indian Ocean

The University of York

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SUMMARY

Terrestrial private protected areas safeguard millions of hectares of biologically significant habitat worldwide, but uptake on submerged lands has been limited, due primarily to the erroneous assumption that the oceans are part of the commons and cannot be owned nor leased. In fact, commercial enterprises have been acquiring rights to marine and coastal areas for centuries for fisheries, energy and other uses. Increasingly, by using Marine Conservation Agreements, organisations like The Nature Conservancy (TNC) have begun to acquire similar rights for purposes that safeguard marine resources and benefit local communities. The Conservancy is developing a wide-ranging analysis of the role and feasibility of MCAs in key regions worldwide. This report examines one such region – the Western Indian Ocean (WIO) – and documents findings from an analysis of the ocean and coastal legal frameworks in Kenya, Tanzania, Mozambique, Madagascar, Seychelles and South Africa.

An exhaustive synthesis of the laws, policies and practices relating to use and management of coastal resources in the region reveals that MCAs are a feasible strategy in four of the five countries under consideration, and identifies suitable conservation partners. Through an additional analysis of the responses of key opinion leaders in the region, 10 MCA projects are identified and summarised and one detailed case study developed. Finally, the report identifies two limitations that may caveat interpretation of findings and suggests additional focused assessments to satisfy information needs.

INTRODUCTION: OF MPAs AND MCAs

The need for marine protected areas (MPAs)

Our seas are vital for our existence (DEFRA 2010; Halpern et al. 2008). They support 80% of the world's biodiversity, supply almost half the oxygen we breathe, and strongly influence the world's climate (DEFRA 2010). They also provide us with more than US$21 trillion worth of ecosystem goods and services, such as nutrient cycling, raw materials, food and tourism (Costanza et al. 1997; Harley et al. 2006).

Despite this value, they face a vitriolic combination of threats, including pollution, habitat loss, climate change and overfishing (Halpern et al. 2008; Harley et al. 2006; Jackson 2008; Lester et al. 2009; IPCC 2007). These anthropogenic pressures have depleted populations of culturally and economically important fish stocks and reduced the structural complexity of various communities across a rich range of habitats, species and trophic levels (Lester et al. 2009; Claudet et al. 2008).

Because of the broad scope and multifaceted nature of the stressors, there has been growing recognition of the importance of an integrated ecosystem approach to the management of the ocean (Foley et al. 2010; Lester et al. 2009). At the centre of such an approach is the use of Marine Protected Areas: parts of the ocean protected from at least some extractive or damaging activities (Worm et al. 2006; Wells et al. 2007). Numbers of MPAs are expanding rapidly (Gray 2008). Today there are more than 5,000 worldwide, but only about 0.78% of the world's oceans have MPA designation, while just 0.02% are afforded full protection from all damaging activities (UNEP-WCMC 2009; IUCN World Commission on Protected Areas 2009).

MPAs that are fully protected from all damaging impacts are termed marine reserves (Roberts & Hawkins 2000). These especially can have a number of benefits (Gell & Roberts 2003). The removal of fishing pressure has been shown to increase average size, diversity, abundance and biomass of invertebrates and fish within protected areas (e.g. Côté et al. 2001; Gell & Roberts 2003; Lester et al. 2009; Micheli et al. 2004; Molloy et al. 2009; Stewart et al. 2009; Halpern 2003; Guidetti et al. 2008; Claudet et al. 2010; Gell & Roberts 2002). There is also evidence that these benefits may have positive consequences for fisheries outside the MPA (Bartholomew et al. 2008; Francini-Filho & Moura 2008; Molloy et al. 2009; Gell & Roberts 2003; Harmelin-Vivien et al. 2008). This can occur through two mechanisms: net export of pelagic eggs and larvae (recruitment effect) and net migration of juveniles and adults across protected area boundaries (spillover effect). (Francini-Filho & Moura 2008; Gell & Roberts 2003; Molloy et al. 2009). Overall, it is clear that there is solid evidence to suggest that reserves can be valuable management tools for the restoration and maintenance of marine ecosystems.

However, in many cases marine protected areas fail to actually protect. (Jennings 2009; Roberts 2005). Inadequate long-term funding and widespread management failure have resulted in unenforceable and ineffectual “paper parks” (Jennings 2009; Langholz & Krug 2004; Mitchell 2005). In a worldwide study of MPAs, for example, less than 16% of protected area managers felt they had adequate funding for effective conservation (Balmford et al. 2004). Most MPAs are therefore failing (Roberts 2005) and, as such, there has been increasing interest in alternative mechanisms for financing and management (Carter et al. 2008; Gallo et al. 2009; Langholz & Krug 2004; Langholz & Lassoie 2001; Sims-Castley et al. 2005; Mitchell 2007; Mitchell 2005).

Marine conservation agreements (MCAs)

Though private protected areas on land are established conservation practice, there has been comparatively little interest to date in private marine parks, primarily because it had been erroneously assumed that the oceans were part of the commons and could not be owned nor leased (The Nature Conservancy & Conservation International. 2008; Langholz & Lassoie 2001). In fact, commercial enterprises have been acquiring rights to marine and coastal areas for centuries; every year they spend billions of dollars developing these areas for fisheries, aggregates, energy, marinas and other uses (The Nature Conservancy & Conservation International. 2008; The Nature Conservancy 2010). Increasingly, environmental organisations like The Nature Conservancy (TNC) have started to acquire or oversee similar rights for purposes that safeguard marine resources and benefit local communities (The Nature Conservancy 2010; Hale 2009). The suite of tools they typically use to accomplish this are known as Marine Conservation Agreements (Hale 2009).

The Nature Conservancy and Conservation International define MCAs as

> any formal or informal understanding between two or more parties in which the parties obligate themselves, for an exchange of benefits, to take certain actions, refrain from certain actions, or transfer certain rights and responsibilities to achieve agreed upon ocean or coastal conservation goals. (The Nature Conservancy & Conservation International. 2008) Table 1 explains the components of Marine Conservation Agreements in more detail.

Table 1:Components of Marine Conservation Agreements

Who		What	Benefits	
Grantor (right-holder) Private parties Local or state government	Grantee Non-Governmental Organisations (NGOs) Communities Private parties (esp. ecotourism) Government agencies	Concession Contract Easement Lease Management agreement Purchase Handshake	Direct Direct payments Jobs Infrastructure Social services Ownership	Indirect Protection of marine environment Increases in biomass, diversity, abundance and size of invertebrates and fish Culture/pride
Sources: **(The Nature Conservancy & Conservation International. 2009; The Nature Conservancy & Conservation International. 2008; The Nature Conservancy 2010)**				

MCA or MPA?

Given the broad nature of the definition noted above, it can be arduous to separate MCAs from their MPA cousins. As one attendee at a December 2009 TNC workshop opined

> When is something an MCA and when isn't it? Does a specific public process and agreement to MPA zoning with the expectation that the public will receive ecological benefits in the future count as an MCA? If so, practically everything is an MCA. (The Nature Conservancy 2010, p.5)

The IUCN defines MPAs as places in the marine environment with "clearly defined geographical space[s], recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values" (Dudley 2009, p.8). As such, an MPA is a designation applied to a place; an MCA is an agreement to act or refrain from acting (The Nature Conservancy 2010). An MCA can help parties assent to the formation of an MPA (*ibid*.). It can compel parties to act in certain ways in certain places, causing areas to operate like MPAs (*ibid*). But an MCA is not an MPA. (*ibid*).

As the case studies given in this report attest, MCAs are a promising tool in international marine conservation. However, their use to date has been limited; the reasons for this are two-fold. First, the role of MCAs in conjunction with other marine conservation strategies is not well-defined nor documented, leading to a lack of awareness, understanding and common base of practice within the marine conservation community (Hale 2009; The Nature Conservancy 2010). Second, different nations have disparate legal and policy frameworks, ownership practices and management regimes, and it is necessary to understand these to determine the feasibility of MCAs in a specific location (Hale 2009). The Nature Conservancy in particular is addressing these limitations by working with partners to develop a detailed and wide-ranging analysis of the role and feasibility of MCAs in key regions worldwide (Hale 2009; The Nature Conservancy 2010).

Aims and objectives

This report examines one such region: the Western Indian Ocean (WIO).It documents findings from a an analysis of the ocean and coastal legal frameworks in Kenya, Tanzania, Mozambique, Madagascar, Seychelles and South Africa (the other WIO nations – Comoros, Mauritius, Somalia and Reunion – were not considered because TNC currently has no active programmes there (Personal communication, Jay Udelhoven). This study has four objectives, namely

1. To determine the number, size and governance of MPAs in the WIO region
2. To review laws, policies and practices relating to protection, use and management of marine and coastal ecosystems in the WIO
3. To identify and summarise existing MCA field projects
4. To highlight non-governmental organisations (NGOs) and other parties that are well positioned to potentially implement future MCAs

Approach

Objective 1: compilation of MPA data

A list of MPAs from the five countries under consideration was synthesised from the academic literature, government agencies, NGOs, intergovernmental organisations and the World Database on Protected Areas (WDPA).

Objective 2: feasibility analysis

Table 2: enabling conditions for employing MCAs

1.	Conservation targets are known or discernable
2.	Threats to the targets and strategies to overcome the threats are known or discernable
3.	MCA stakeholders and their issues are identifiable and addressable
4.	Costs and sustainable funding are realistic and available
5.	Relevant laws and policies are amenable
6.	Ownership, management, or use rights that relate to the conservation targets and threats are identifiable, assignable, and transferable
7.	Entities willing and able to serve as implementers exist or can be created

Source: (The Nature Conservancy & Conservation International. 2009)

Table 2 outlines the circumstances that best facilitate use of marine conservation agreements. Through a high-level review of the academic literature, as well as reports and documentation from NGOs, government agencies and inter-governmental organisations (IGOs), this report determines whether all seven are present or addressable in the nations under consideration, and as such, whether MCAs are a viable conservation strategy. Points one to four are dealt with on a regional basis in Chapter 2; points five to seven on a country-by-country basis in the subsequent sections.

Objective 3: summaries of existing MCA field projects

From a synthesis of the literature, 86 key opinion leaders (KOLs) from academia, the private sector, government agencies and NGOs were identified and emailed. Sixty-two replied, a response rate of 72%. And from these responses, 13 potential MCA sites were identified and 10 summaries developed. One of these summaries was developed into a detailed case study.

Objective 4: lead implementers

Throughout the project, NGOs and agencies that are well positioned to potentially implement MCAs were identified. The assessment focussed primarily on expertise, resources and stability, as well as existing relationships with relevant communities.

THE WESTERN INDIAN OCEAN

Introduction

The previous section traced the history of private protected areas as a tool for biodiversity conservation, defined and explained marine conservation agreements and outlined the aims, objectives and approach of this report. This chapter evaluates the feasibility of using marine conservation agreements in the WIO through a regional-level analysis of the first four enabling conditions outlined in Chapter 1 (Table 2). To this end, this chapter examines marine biodiversity and the threats facing it in the regions (Objective 1), as well as the MPAs and MCAs that attempt to combat these threats (2). Finally, it considers stakeholder issues (3) and availability of funding for MCA projects (4).

Geography and conservation targets

The Western Indian Ocean region refers to the African coastal states of Somalia, Kenya, Tanzania, Mozambique and South Africa, together with the Indian Ocean island states of Comoros, Madagascar, Mauritius, Reunion (France) and Seychelles (UNEP 2007; UNEP/Nairobi Convention Secretariat and WIOMSA 2009). The region is crossed by the equator, so climatic conditions are generally tropical, except in South Africa, where they are moderately sub tropical (Arthuron & Korateng 2006; UNEP/Nairobi Convention Secretariat and WIOMSA 2009).

The mainland WIO area stretches for 13,000 km along the coast from Somalia in the north to South Africa in the south (UNEP/Nairobi Convention Secretariat and WIOMSA 2009). The island states enjoy a further 6,360 km of coastline around more than 400 islets and islands (UNEP/Nairobi Convention Secretariat and WIOMSA 2009). In terms of surface area, the largest island state is Madagascar; the biggest on the mainland, South Africa (*ibid*.). The coastal areas of the region are inhabited by some 40 million people (Francis & Torell 2004; Hewawasam 2000). And population density is wildly uneven: a third of both Mozambicans and South Africans and a quarter of Tanzanians live by the coast, whereas vast tracts of coastal Somalia are almost entirely uninhabited (Francis & Torell 2004).

The region covers about 40 degrees of latitude and, as such, is highly biodiverse (Obura et al. 2004; WWF Eastern African Marine Ecoregion. 2004a; WWF Eastern African Marine Ecoregion. 2004b; Salm & Tessema 1998). There are at least 200 species of coral, 11 of mangrove (covering 12,000km^2) and 12 of seagrass, together with 1,500 species of fish, 3,000 species of molluscs, 450 species of crabs, 300 species of echinoderm and five of the world's seven marine turtle species (WWF Eastern African Marine Ecoregion. 2004a; UNEP 2007; WWF Eastern African Marine Ecoregion. 2004b; Guerreiro et al. 2010). Overall species composition is enormously rich,

exceeding 11,000 species of plant and animal, 60-70% of which are found only in the Indo-Pacific ocean (WWF Eastern African Marine Ecoregion. 2004b; WWF Eastern African Marine Ecoregion. 2004a).

Threats to marine biodiversity and strategies to combat them

Threats

However, despite the substantial value of its environmental assets, the Western Indian Ocean is facing a multitude of resource management and environmental challenges (Moffat et al. 1998; Barnett & Patterson 2006). There are four overarching threats to marine biodiversity: overexploitation of natural resources, habitat degradation, land-based sources of pollution, and marine pollution (Billé & Rochette 2010; Borja et al. 2008; WWF Eastern African Marine Ecoregion. 2004a; WWF 2004a; WWF 2004b). Table 3 summarises the sources of these threats. Appendix 2 considers their underlying causes.

Table 3: Key threats to marine biodiversity in the WIO and their sources

Threat	Sources
Over exploitation of natural resources	▪ Overharvesting of fish stocks and invertebrates ▪ Destructive fishing practices ▪ Mangrove destruction/conversion ▪ Poaching of turtles and eggs
Habitat degradation	▪ Mangrove and coastal forests clearance ▪ Coastal urbanisation and industrialisation ▪ Development of transport infrastructure ▪ Conversion to agriculture and aquaculture ▪ Coral mining for building materials
Land-based sources of pollution	▪ Tourism ▪ Coastal urbanisation and industrialisation ▪ Agricultural pollution ▪ Soil erosion ▪ Land-based extraction of minerals, oil and gas
Marine pollution	▪ Oil and gas development ▪ Oil spills and illegal discharges ▪ Hazardous waste dumping ▪ Noise pollution

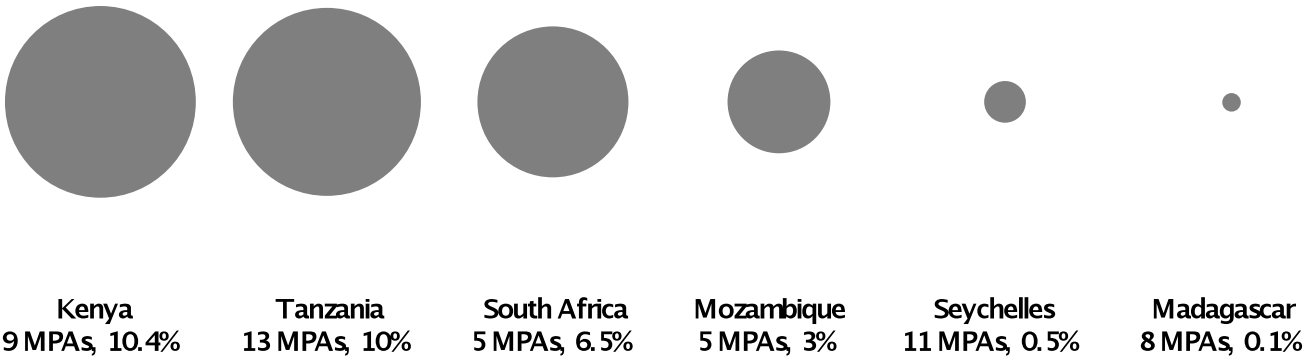
Sources: **(Arthuron & Korateng 2006; Billé & Rochette 2010; Borja et al. 2008; Moffat et al. 1998; UNEP 2007; WWF 2004a; WWF 2004b; WWF Eastern African Marine Ecoregion. 2004a)**

Strategies: marine protected areas in the WIO

MPAs have been around in the WIO since the mid 1960s, when the Ilhas da Inhaca e dos Portugueses Faunal Reserve was gazetted in Mozambique in 1965 (UNEP-WCMC 2010). Kenya followed suit three years later, establishing The Malindi and Watumu Marine National Parks and the Malindi-Watumu Marine National Reserve (UNEP-WCMC 2010). The early reserves tended to be small (less than 10km^2) and designed to protect a specific habitat such as a turtle-nesting beach (Wells et al. 2007). By the 1990s, the emphasis had shifted to larger, multiple-use sites, often based on more participatory forms of management (*ibid*.). Today, MPAs can be found in all of the countries under consideration, though estimates of their numbers vary considerably from

around 80 (Chircop et al. 2010; Gaspar 2010) to around 50 (IUCN 2004; UNEP-WCMC 2010). This study found 51 MPAs, with a total coverage of 11,850km^2. Forty-four areas had reliable estimates of their size, and these varied across five orders of magnitude. The largest, at 2,396km^2, was South Africa's iSimangaliso Wetland Park; the smallest, at just 0.01km^2, the Cousin Island Special Reserve in the Seychelles. Mean MPA size was 242km^2, although three quarters were smaller than 245km^2, with a median reserve size of 21.6km^{2}In terms of proportion of marine areas protected, only Tanzania and Kenya exceeded 10%, with the others considerably smaller (Figure 1).

Figure 1: Marine Protected Areas in the Western Indian Ocean (2010)
as % of territorial waters up to 12 nautical miles



Sources: developed from: (UNEP-WCMC 2010; IUCN 2004; Salm & Tessema 1998; Wells et al. 2007; WWF 2004b)
Note: South Africa has more than 5 MPAs, but these fall in waters not considered part of the WIO

Strategies: marine conservation agreements in the WIO

Of the 51 MPAs identified by this report, nine were MCAs and one had an MCA component as part of a broader MPA framework (The turtle conservation programme at the Mafia Island MPA in Tanzania). Three further projects (Varanda and Praia da Rocha in Mozambique and Baie Ternay in the Seychelles) appeared to satisfy the definition of an MCA, but sufficient information was not available to confirm this. Despite this, taken together, these projects show unambiguously that not only are MCAs conceivable in the Western Indian Ocean, they are already in use at several sites (Table 4)

Table 4: Existing and Suspected MCA projects in the WIO

Country	Site	Size (km^2)	Years	Manager	Implementer	Incentives	Conservation
Madagascar	Massif des Roses	0.02		Local village	Reef Doctor		Seasonal no take zone
Madagascar	Velondriake	700		Local village	Blue Ventures		No take zones
Mozambique	North Quirimbas	230	n/a	Maluane Initiative	Maluane Initiative	Cash payment	Leased management rights
Mozambique	Vilanculos	80	50	East African Wildlife	East African Wildlife	Cash payment	Leased management rights
Mozambique	Varanda	Unknown	n/a	Private owners	Private owners	Cash payment	No take zone
Mozambique	Praia da Rocha	Unknown		Local village	Private owners	Cash payment?	Reduced fishing effort
Seychelles	Aride Island	0.70	n/a	Island Conservation Society	Island Conservation Society	Cash payment	Transfer of ownership. No take zone
Seychelles	Cousin Island	0.01	n/a	Nature Seychelles	Nature Seychelles	Cash payment	Transfer of ownership. No take zone
Seychelles	Baie Ternay		99	Emirates Hotels and Resorts	Emirates Hotels and Resorts		
Tanzania	Chumbe Island	0.30	10	Private: CHICOP	CHICOP	Cash payment	Leased management rights. No take zone
Tanzania	Mnemba Island	0.15		Local village	Conservation Corporation Africa, Local village, Government	Cash payment, capacity building	Leased management rights. No take zone
Tanzania	Misali Isalnd	21.60		Local village	CARE International, Local Village	Cash payment, capacity building	Leased management tights. No take zone
Tanzania	Mafia Island	615		Government	WWF, Sea Sense, Local community	Cash payment	Turtle conservation

Sources: (UNEP-WCMC 2010; Salm & Tessema 1998; IUCN 2004; McClanahan et al. 2005; Hatton 2001; United Nations 2008; Wells et al. 2007; Cinner & Fuentes 2008; Cinner et al. 2009; Belle et al. 2009; Harris 2009; Gaspar 2010; Government of Seychelles Department of Environment 2010; Jennings et al. 1996; Mwaipopo 2008; Obura et al. 2004; Ruitenbeek et al. 2005; Tobey & Torell 2006; Wagner 2007)

These existing initiatives range in scale from 0.01km^2 to 700km^2 and in duration from 10 years to perpetuity. They include various types of agreements including:

- Contracts and leases with local villages to set up, manage, enforce or support marine protective areas and actions for turtle conservation and tourism purposes;
- Concessions with governments for tourism and MPA management;

- Contracts with user groups to modify fishing effort, gear and areas; and
- Purchase and sale agreements with private entities for conservation purposes

MCA stakeholders and stakeholder issues

As elsewhere in the world, stakeholders in MPAs and MCAs in the WIO include national government agencies, big international non-governmental organisations (BINGOs), resource users, local communities, and NGOs and private organisations operating in the area (The Nature Conservancy 2010). Individual stakeholders will vary from site-to-site (*ibid*.). Marine conservation agreements, like all other conservation techniques, have both benefits and drawbacks (The Nature Conservancy & Conservation International. 2008; Langholz & Krug 2004). Given the wide-range of MCA approaches noted earlier, it is challenging to generalise. Nonetheless, from an analysis of the literature and information supplied by the KOLs, three main themes emerged, all of which are addressable.

Stakeholder issues

UNEASE AT PAYING FOR CONSERVATION. There is evidence that some initiatives in the region have paid fishermen to stop them using damaging techniques such as dynamite fishing (The Nature Conservancy 2010). This type of arrangement rewards the destructive fishers for their poor past behaviour, whilst their non-destructive counterparts receive nothing for the past or present good behaviour (*ibid*.). The result is that the non-destructive fishermen are incentivised to start fishing destructively (*ibid*.).

This issue can be addressed by ensuring that all stakeholders at a given MCA site are engaged in the decision-making process regarding incentive packages and that such a package is rigorously assessed to account for site-specific issues (The Nature Conservancy 2010; Gjertsen & Niesten 2010; Gjertsen et al. 2010).

PROFIT MOTIVE. Where MCA projects involve the private sector – where a hotel manages its own reserve, for example – critics have contended that environmental and social concerns will always be subservient to profit. (Colwell 1998; Mitchell 2007; Gallo et al. 2009; Cousins et al. 2008). As such, reserve owners dependent on tourism may be tempted to degrade resources in deference to their bottom lines as opposed to safeguarding them (Langholz & Krug 2004). Others have noted that, to date, marine ecotourism enterprises have created only a few jobs, escalated local reliance on a single revenue stream and increased profit leakage (Stonich 2009). These concerns are in part unfounded as MCAs relying on tourism need to preserve species and habitat to attract tourists (Langholz & Krug 2004; Mitchell 2005). Nonetheless, to allay any fears, they could permit external monitoring and evaluation of their biodiversity impacts (Langholz & Krug 2004).

FOREIGN OWNERSHIP. On land, around a third of private reserves in East Africa are exclusively foreign-owned. Some communities consider this to be a "land" grab or insidious form of neo-colonialism (Langholz & Lassoie 2001) and underscores the importance of responding to the needs, perspectives, and traditions of local communities throughout the stakeholder engagement process (The Nature Conservancy 2010).

Availability of funding

Whilst sufficient state funding for marine conservation projects is an issue throughout the WIO, substantial donor support has been made available for initiatives in the region in recent years. Table 6 details key projects by donor

Table 6: key recent marine conservation projects in the WIO

Donor	Project
WWF	▪ Kiunga Marine National Reserve in Kenya ▪ Mafia Island Marine Park, Menai Bay Conservation Area and Rufiji-Mafia-Kilwa Seascape in Tanzania ▪ Bazaruto Archipelago National Park and Quirimbas National Park in Mozambique ▪ Regional East Africa Marine Ecosystem programme.
ICRAN	▪ Malindi/Watamu Marine National Park and Reserve in Kenya ▪ Dar es Salaam Marine Reserves in Tanzania
IUCN	▪ Mnazi Bay-Ruvuma Estuary Marine Park and Tanga Coastal Zone Programme in Tanzania ▪ Several initiatives in Kenya
GEF	▪ Coastal and marine biodiversity conservation in northern coastal Mozambique

Sources: (IUCN 2004; Hatton 2001; WWF 2004a; WWF 2004b)

Regional feasibility analysis

It is clear from the above that the six WIO countries under consideration all have

1. Known conservation targets
2. Known threats to the targets and strategies to overcome the threats
3. Identifiable and addressable stakeholder issues
4. Realistic and available funding.

Accordingly, by the first four criteria of the feasibility analysis (Table 2, Chapter 1) MCAs are a realistic conservation strategy. Evaluation of the final three criteria – amenable laws and policies; identifiable and assignable ownership, management or use rights; and willing implementers – is the subject of the next section.

COMPARATIVE COUNTRY ANALYSIS

The previous chapter summarised regional conservation targets, and usage of MPAs and MCAs – two of the strategies used to address them. It concluded with a consideration of stakeholder issues and funding availability. Using the final three criteria outlined in chapter 1 (page 12), this section analyses the specific situation in each of the five countries under consideration to determine the overall feasibility of MCA implementation.

KENYA

Kenya's coastline is dominated by fringing coral reefs, mangroves and sea grass beds, with broad stretches of sandy substrate at the mouths of the county's two largest rivers, the Tana and Athi (United Nations 2008; Obura 2001; UN FAO 2007a). As Table 8 shows, the country has nine marine parks and reserves, established between the late 1960s and the mid 1990s.

Table 8: Marine Protected Areas in Kenya

Site	IUCN Category	Size (km^2)	Date established	Governance type
Kisite	II	28.00	1978	Government
Malindi	II	6.30	1968	Government
Kiunga	VI	250.00	1979	Government
Diani	VI	75.00	1995	Government
Mombasa	VI	200.00	1986	Government
Mombasa	II	10.00	1986	Government
Watamu	II	10.00	1968	Government
Mpunguti	VI	11.00	1978	Government
Malindi-Watumu	VI	245.00	1968	Government

Sources: (Salm & Tessema 1998; UNEP-WCMC 2010; IUCN 2004; McClanahan et al. 2005; United Nations 2008; Wells et al. 2007)

Legal and policy framework

Kenya has an array of national environmental legislation that has created overlapping and conflicting remits for managing marine and coastal issues (Obura 2001; UNEP/Nairobi Convention Secretariat and WIOMSA 2009). Much of the legislation is decades old and no longer sufficiently robust to cope with current anthropogenic pressures such as increasing coastal populations (Obura 2001; United Nations 2008). As such, marine and coastal ecosystems have been degraded, even within protected areas (UNEP/Nairobi Convention Secretariat and WIOMSA 2009).

One of the very few modern pieces of legislation relevant to MCA and MPA implementation is the Environmental Management and Coordination Act 1999, which establishes an overarching legal and institutional framework for the managemen

t of Kenya's environment (UNEP/Nairobi Convention Secretariat and WIOMSA 2009; McClanahan et al. 2005). Of particular pertinence is section 55, which acknowledges the central role of Integrated Coastal Management (ICM or ICZM) in the protection of marine and coastal systems (United Nations 2008; UNEP/Nairobi Convention Secretariat and WIOMSA 2009; WWF 2007). The Act imposes severe penalties regarding land-based marine pollution, though there are no documented cases of offenders being fined or imprisoned (United Nations 2008; UNEP 2007; WWF 2007). Specific MPAs are established under the Wildlife Conservation and Management Act of 1976 (McClanahan et al. 2005; National Environment Management Authority 2009). The Act itself has no MPA-centric provisions, but, as it becomes harmonised with the Environment Coordination and Management Act, this is likely to change (McClanahan et al. 2005). Relevant laws and policies are summarised in Table 9.

Table 9: Key policy and legislation relating to the marine and coastal protection

Policy or Law	Relevance
Policies and Frameworks	
National Environmental Action Plan (NEAP)	Overarching national environmental policy, approved in 1999
National Biodiversity Strategy and Action Plan (NBSAP)	National framework of action for the implementation of the Convention on Biological Diversity
Legislations	
Environmental Management and Coordination Act 1999 (EMCA)	Legal and institutional framework for the management of Kenya's environment
Wildlife Conservation and Management Act 1976	Designation of MPAs
Fisheries Act	Development, management, exploitation, utilisation and conservation of fisheries resources
Physical planning Act 1996	Governs all land use and planning, especially in urban centres. Enforcement is sporadic and substandard
Local Government Act	Chapter 265 regulates local authorities, including waste water and sewerage treatment and disposal
Coast Development Authority Act 1990	Sets up an Authority to oversee and plan the implementation of coastal and EEZ development projects
Water Act 2002	Gives the relevant Minister powers to gazette river catchments areas as protected areas
Maritime Zones Act 1989	Consolidates the laws relating to the territorial waters

Sources: (Hatton 2001; McClanahan et al. 2005; WWF 2007; WWF 2004; UN FAO 2007a; UNEP/Nairobi Convention Secretariat and WIOMSA 2009; United Nations 2008; Obura 2001; National Environment Management Authority 2009)

Owners and managers

Marine waters are a public property vested in the government, so ownership or leasing is not permitted (Personal Communication, Dishon Murage). Further, MPAs have traditionally been founded and managed by the Government with minimal stakeholder engagement. With the advent of the Fisheries (Beach Management Unit) Regulations of 2006, however, co-management is

gaining increasing prominence (Cinner et al. 2009). Beach Management Units (BMUs) allow resources users such as fisherman to manage their landing sites and in so doing conserve resources (*ibid*.). There are presently 33 on the Kenyan coast (*ibid*.).

Management of MPAs is the responsibility of Kenya Wildlife Service (KWS), a parastatal body of the Ministry of Tourism. Table 10 summaries key institutions and committees.

Table 10: Key government departments and committees relating to coastal resources

Department/committee	Role/responsibility
National Environmental Management Authority (NEMA)	Coordination and oversight of all environmental matters Principal instrument in the implementation of all environmental policies
National Environment Council (NEC)	Formulates policy, sets national goals for environmental protection and promotes cooperation amongst stakeholders
Kenya Wildlife Service	Manages all designated MPAs
Fisheries Department	Closes areas and seasons to all or designated species of fish or methods of fishing
Coast Development Authority	Coordinates coastal development activities
Marine Fisheries Research Institute (KMFRI)	Marine biological, ecological and fisheries research
Kenya Sea Turtle Conservation Committee	Comprises NGOs, scientists, resource managers and private individuals. Mandated to direst the sea turtle recovery nationally

Sources: (Hatton 2001; McClanahan et al. 2005; WWF 2007; WWF 2004a; UN FAO 2007a; UNEP/Nairobi Convention Secretariat and WIOMSA 2009; United Nations 2008; Obura 2001; National Environment Management Authority 2009; Font et al. 2004; Muthiga 2009; Malleret-King et al. 2003)

MCA Implementation

Because ownership and leasing of submerged lands is not permitted and because co-management of marine resources is a strategy still in its infancy, Kenya is at present not well positioned to implement Marine Conservation Agreements. This is compounded by a number of sizeable legislative gaps, together with lax enforcement of existing legislation (UNEP/Nairobi Convention Secretariat and WIOMSA 2009; WWF 2004a). Perhaps unsurprisingly, this report was unable to find a single example of a functional MCA project in the country.

There is, however, some cause for optimism. In August 2010, Kenya adopted a new constitution, Article 42 of which declares: "Every person has the right to a clean and healthy environment, which includes the right...to have the environment protected for the benefit of present and future generations through legislative and other measures." (BBC 2010; Walljaspar 2010). It is at present unclear what this means for management of the Kenyan marine environment, but it is conceivable that it could result in legislation more favourable to the adoption of MCAs. In such a scenario, the best-placed implementation partner would be the WWF, which has been running a community engagement project at the Kiunga Marine National Reserve since the mid 1990s (Wells 2004; Hatton 2001; Obura 2001). And should the new constitution grant additional control to Beach Management Units, the Wildlife Conservation Society (WCS) could be another valuable partner.

The Society is active in Kenya and helped to establish the Velondriake MCA under a comparable framework in Madagascar (Cinner et al. 2009).

MADAGASCAR

With its high levels of endemism and species richness, Madagascar is consistently cited as a global conservation priority (Cinner & Fuentes 2008; Rogers et al. 2010; Harris 2009). Its 5,000km of coastline and 270 islets host the most biologically diverse marine life in the WIO (Koopman 2008). At present, these assets are ineffectively safeguarded (Rabearivony et al. 2010). As noted in chapter 1, Marine Protected Areas in Madagascar cover just 0.1% of the country's territorial waters. Table 11 shows Madagascar's MPAs in more detail.

Table 11: Marine Protected Areas in Madagascar

Site	IUCN Category	Size (km^2)	Date established	Governance type
Nosy Atafana	II	10.00	1989	Collaborative
Mananara-Nord	--	10.00	1990	Government
Masoala	II	100.00	1997	NGO
Nosy Tanikely	--	0.10	1995	--
Sahamalaza-Nosy	--	322.00	2001	Government
Toliara	--	360.00	2003	Government
Massif des Roses	--	0.02	2007	Collaborative
Velondriake	--	700.00	2009	Collaborative

Sources: (Salm & Tessema 1998; UNEP-WCMC 2010; IUCN 2004; Harris 2009; Cinner & Fuentes 2008; Belle et al. 2009)

Legal and policy framework

Malagasy environmental policy is based on a Charter adopted in 1990 (Billé & Mermet 2002; UNEP/Nairobi Convention Secretariat and WIOMSA 2009). Between 1991 and 2009, this policy was enacted through the National Environmental Action Plan (NEAP), a three-phase multi-donor programme (Billé & Mermet 2002; Madagascar National Parks 2010). However, there is no separate or clearly defined policy on conservation of the marine environment (Cinner et al. 2009). Although management of both terrestrial and marine protected areas is governed by the Code des Aires Protégées (COAP), there is a clear bias towards terrestrial ecosystems (Durbin 2007; Madagascar National Parks 2010; Cinner et al. 2009). Accordingly, early MPAs like Nosy Atafana and Masoala were initially established through a top-down procedure rooted in terrestrial conservation and largely without community involvement (Cinner et al. 2009).

In 1996, this changed with the introduction of a legal framework to enable community-based management of natural resources, known as Gestion Locale Sécurisée (GELOSE) (Cinner et al. 2010; Rakotoson & Tanner 2006). Then in 2003 at the fifth World Parks Congress in Durban,

South Africa, the Malagasy president recognised the need to protect the country's unique natural assets and committed to the Durban Vision, a national conservation plan to triple the amount of protected area coverage (Durbin 2007; Rabearivony et al. 2010). This was codified into law shortly afterwards as a new decree (Décret d'Application No 848-05) for the existing COAP (Durbin 2007). The decree set up a System of Protected Areas of Madagascar, or SAPM, which simplified and redefined the legal process used in protected area creation (IRIN 2006). Under this more flexible model, organisations other than Madagascar National Parks (formerly ANGAP), the state protected areas agency, are allowed to manage protected areas and that these could include NGOs, community organisations, and the private sector (Durbin 2007; Rabearivony et al. 2010).

Owners and managers

Table 12 outlines major activities relating to use and management of coastal resources, together with the agencies working to implement programmes in these areas.

Table 12: Overview of key coastal resource activities in Madagascar and implementing agencies

Topic/activity	Agency/committee
National Environmental Action Plan	Coordinated by ONE, the National Office for the Environment
Development of environmental policies and strategies	The Inter-Ministerial Environment Committee (IMEC), The National Environment Council, The Executive Committee, The National AG (''Groupe de Travail et de Réflexion'')
Management of fisheries	Directorate of Fishing and Fish Resources of The Ministry of Agriculture and Fisheries (MAEP)
Biodiversity & Protected Areas	Directorate of Waters and Forestry (DEF), Madagascar National Parks (MNP), Foundation for Protected Areas and Biodiversity, CARE International, WCS, Blue Ventures, ReefDoctor, WWF
Tourism and ecotourism	Ministry of Tourism, MNP

Sources: (Aricò & Rakotoary 1997; UN FAO 2008; UNEP/Nairobi Convention Secretariat and WIOMSA 2009; Rakotoson & Tanner 2006; Billé & Mermet 2002; Cinner et al. 2009; Brinkerhoff 1996; Durbin 2007; IRIN 2006; Viltz 2008; Harris 2009; Belle et al. 2009)

MCA implementation and examples

The recent advances in the Malagasy legal and policy framework noted above mean that there is scope for implementing MCAs in the country. Indeed this analysis found two extant MCA projects, which are detailed below.

Massif des Roses

Massif des Roses is a small patch reef within the Bay of Ranobe in south-west Madagascar (Belle et al. 2009). The NGO ReefDoctor worked with local communities, regional and local government, hotels, tour operators and other conservation organisations there to establish FIMIHARA, an association of local stakeholders responsible for managing the this site and developing sustainable conservation initiatives (*ibid.*). The structure of FIMIHARA was based on the FIMIMANO community association at nearby Nosy Ve Island, which was formed in 1998 to resolve conflict over the island's natural resources (Belle et al. 2009; Rakotoson & Tanner 2006).

The site has been legally recognised as a community managed marine reserve under temporary protection since 25 May 2007 by the Direction Régionale du Développement Rural, which entails that fishing, dropping anchor and theft of materials are forbidden (*ibid*.). Tourists visiting the site pay an entry fee of 2000 ariary (USD1) with proceeds used to fund community projects.

Velondriake

British NGO Blue Ventures, together with the University of Toliara's Institut Halieutique et des Sciences Marines (IHSM) and WCS-Madagascar, are presently working with local communities to develop a network of community-run marine, coastal and terrestrial protected areas in the Andavadoaka region of south-west Madagascar (Harris 2009; Gildas & Harris 2008). The network, the Velondriake Community Managed Protected Area (VCMPA), spans over 700km^2 of coral reefs, mangroves, lagoons, beaches and sea grass beds, which, when fully implemented, will make it the largest marine protected area in Madagascar (Gildas & Harris 2008; Cripps & Harris 2009). The initiative is driven and managed entirely by local communities, with resource use and access rights within the area governed by local community laws (Gildas & Harris 2008). The VCMPA is 80% funded through revenue generated from Blue Ventures' marine tourism expeditions, with the remainder coming from grants and private donations (Edwards & Hooper 2009).

These two examples conclusively demonstrate that MCAs are feasible in Madagascar. ReefDoctor, Blue Ventures and the WCS would therefore be suitable conservation partners in any future initiatives. There are further potential sources of funding too. The Foundation for Protected Areas and Biodiversity is a conservation trust established by the Government of Madagascar, Conservation International and WWF to help finance the protection, maintenance and expansion of Madagascar's protected areas network (Viltz 2008). Thanks in part to a debt-for-nature swap agreement between the French and Malagasy governments in 2008, the fund has met its endowment target of $50 million (*ibid*.).

There is, however, one caveat. The examples noted above derive legitimacy from the codification of local community laws known as dinas, rather than from the GELOSE which was designed to strengthen them (Cinner et al. 2009). This is largely because the GELOSE framework is not well suited to marine systems (*ibid*.). Because of this, Velondriake and Massif des Roses lack formalised, explicit contracts between all entities involved in the management and can only charge voluntary entrance fees (Cinner et al. 2009; Cripps & Harris 2009). The application decree of GELOSE to the marine environment is pending (Cinner et al. 2009), but for now, this limitation may hamper wider-scale adoption of the MCA strategy.

MOZAMBIQUE

With its extensive coral reefs, mangrove forests, sea grass beds coastal lagoons, as well as large populations of endangered sea turtles and dugongs, the coastal zone of Mozambique is unique in East Africa (Ministry for the Coordination of Environmental Affairs 2010; Hewawasam 2000). Despite a coastline of almost 3000km in length, Mozambique has just 5 MPAs covering around 3% of its territorial waters (table 13).

Table 13: Marine Protected Areas in Mozambique

Site	IUCN Category	Size	Date	Governance
Bazaruto	II	1430.00	2001	Government
Ilhas da Inhaca e dos	VI	1.00	1965	Government
Quirimbas	--	1522.00	2002	Government
North Quirimbas	--	230.00	2008	Private
Vilanculos	--	80.00	2000	Private

Sources: (Salm & Tessema 1998; UNEP-WCMC 2010; IUCN 2004; Gaspar 2010; Hatton 2001; WWF 2004b; Wells et al. 2007; Spenceley 2003)

Legal and policy framework

Protected areas are established under the Forestry and Wildlife Act 1999 (WWF 2004b; WWF 2007). In addition, although there is no MPA-specific legislation, decree 16/96, the Marine Fishery Regulation, permits the designation of National Marine Reserves, Nature Marine Parks and "protected marine areas" (WWF 2004b). Table 14 summarises key law and policy relating to use and conservation of marine resources.

Table 14: Key policy and legislation relating to the marine and coastal protection

Policy or Law	Relevance
Policies and Frameworks	
National Environmental Management Programme (NEMP, 1995)	Overarching national environmental strategy seeking to promote and implement sound environmental policy.
Land Policy (1995)	Maintains the fundamental tenet that land ownership is vested in the State but recognising traditional usage rights
National Strategy and Action Plan for the Conservation of Biodiversity	Plan to meet the targets of the Convention on Biological Diversity (Appendix 1) including conservation of marine resources
Fisheries Policy and Implementation Strategy (1996)	Aims to maximize economic benefits whilst ensuring sustainable harvesting of the resource
National Tourism Strategy and Policy	Recognizes the need to develop tourism sustainably and promotes private sector investments
Legislation	
Framework environment law (1997)	Legal and institutional framework for the management of Mozambique's environment
Land Law (1997)	Determines that the land is State property and may not be sold. Provides a further legal basis for designating protected areas
Forestry and Wildlife Act (1999)	Establishes protected areas
Fisheries Law and Regulations	Governs the adoption of an array of fisheries management and conservation measures
Local Organs Law	enables district authorities to propose and designate protected areas through their land use planning powers

Sources: **(Chircop et al. 2010; WWF 2007; WWF 2004b; UNEP/Nairobi Convention Secretariat and WIOMSA 2009; UN FAO 2007c; Hatton 2001; Gaspar 2010)**

Owners and managers

Responsibility for overall environmental management rests with MICOA, The Ministry for the Co-ordination of Environmental Affairs (Hatton 2001; Chircop et al. 2010). The mandate for protected areas sits with the Ministry of Tourism, under the DNAC (National Directorate for Conservation Areas) as tourism is seen to be an avenue for financing conservation (Chircop et al. 2010; WWF 2004b). The National Directorate for Environmental Management within MICOA facilitates the identification of MPA and bolsters management (WWF 2004b). Finally, both the Institute for Development of small scale Fisheries (IDPPE) and the National Fisheries Research Institute (IIP) handle fisheries issues relating to MPAs (WWF 2004b; WWF 2007).

MCA implementation and examples

Though ownership of submerged lands is vested in the state, it may transfer the rights of use if it wishes (WWF 2004b; Spenceley 2003). Indeed, this study identified two large-scale MCA projects operating in the country where this has occurred.

Vilanculos Coastal Wildlife Sanctuary (VCWS)

The VCWS is situated just south of Bazaruto National Park, in an area of high marine endemism (Spenceley 2003). Rights over the 300km^2 sanctuary (80km^2 of which is marine, the rest, terrestrial) were granted to private consortium East African Wildlife in 2000 through a 50 year concession (*ibid*.). The concession was awarded on merit, in return for the promise of significant

commercial investment and the creation of at least 150 jobs for the local community (*ibid*.). Revenues from tourist levies and visitor fees accrue in a Community Development Fund, which is expected to generate USD70,000 per annum: funds that can be used and distributed by the local community as they see fit (*ibid*.).

North Quirimbas

In 2001, the Maluane initiative, a partnership between the Zoological Society of London (ZSL) local communities and the private sector, won a concession to manage an area of 230km^2 around Vamizi Island in northern Quirimbas, close to the Tanzanian border (Garnier et al. 2008). The project supports the socio-economic development of local communities through up-market ecotourism (*ibid*.). As in the Vilanculos example above, tourist levies are reinvested in the community (*ibid*.). Other economic incentives include employment, social services and micro-enterprise (*ibid*.).

An additional two further projects are suspected to be MCAs but insufficient evidence was available to confirm this. These are: the Varanda private reserve in northern Mozambique, the owners of which have acquired rights to manage a small coastal lagoon as a no take zone for ecotourism (Personal Communication, Bart Otto); and the Praia da Rocha resort in the south of the country, which has negotiated a reduced fishing effort along its shoreline (personal communication, Simon Pierce).

Taken together, these examples show that MCAs are a viable strategy for the conservation and management of marine resources in Mozambique. Implementing partners could therefore include the Zoological Society of London and the WWF, which has completed projects in Quirimbas and Bazaruto National Parks (Ministry for the Coordination of Environmental Affairs 2010).

SEYCHELLES

The Seychelles archipelago has an exclusive economic zone (EEZ) of 1.3 million km^2 but just 453km^2 of land (Government of Seychelles Department of Environment 2010). Marine biodiversity is the country's most important natural resource but it is not as studied nor protected as its terrestrial counterpart (*ibid*.) and the country's MPA network only covers 0.5% of its territorial waters (Table 15)

Table 15: Marine Protected Areas in Seychelles

Site	IUCN	Size (km^2)	Date	Governance
Aldabra	Ia	142.00	1981	Government
Aldabra Atoll	--	142.00	1982	Government
Aride Island	Ia	0.70	1973	NGO
Ste. Anne	II	9.96	1973	Government
Port Launay	II	1.54	1979	Government
Cousin Island	Ia	0.01	1975	NGO
Curieuse	II	12.84	1979	Government
Baie Ternay	II	0.86	1979	Government
African Banks	Ib	8.27	1987	Government
Ile Cocos, Ile La Fouche, Ilot Platte	--	1.65	1997	Government
Silhouette	II	16.55	1987	Government

Sources: (Salm & Tessema 1998; UNEP-WCMC 2010; IUCN 2004; Jennings et al. 1996; Government of Seychelles Department of Environment 2010)

Legal and policy framework

Article 38 of the Seychelles Constitution declares that it is the right of every person to live in and enjoy a healthy, clean ecologically balanced environment (UNEP/Nairobi Convention Secretariat and WIOMSA 2009). This right is enacted primarily through the Environment Protection Act (EPA) 1994, the country's framework environmental legislation (*ibid*.). Fifteen separate acts can be used to designate MPAs, the most important of which are the National Parks and Nature Conservancy Act (CAP 141), the Fisheries Act (CAP 82) and the Protected Area Act (CAP 185) (Edwards & Hooper 2009; Wells et al. 2007). Table 16 summarises pertinent laws and policies.

Table 16: Key policy and legislation relating to the marine and coastal protection in Seychelles	
Policy or Law	Relevance
Policies and Frameworks	
Environmental Management Plan of Seychelles (EMPS) 2000-2010.	Overarching national environmental strategy aiming to protect the environment through coherent and inclusive planning
The National Biodiversity Strategy and Action Plan (NBSAP) 1997	Plan to meet the targets of the Convention on Biological Diversity (Appendix 1) including conservation of marine resources
The National Land Use Plan 1993	Guide to land use decision making covering the three main islands of Mahé, Praslin and La Digue only.
Legislation	
The Environment Protection Act (EPA) 1994	The framework environmental legislation for the country
National Parks and Nature Conservancy Act (CAP 141)	Establishes protected areas
The Fisheries Act (CAP 82)	Establishes protected areas, fisheries management measures, licensing procedures and fines for breaches of regulations
Protected Area Act (CAP 185)	Establishes protected areas
Town and Country Planning Act 1972	Sets out requirement for planning permission for all forms of terrestrial development and prevents buildings being erected within 25 metres of the high water mark
Sources: **(UN FAO 2007b; UNEP/Nairobi Convention Secretariat and WIOMSA 2009; Edwards & Hooper 2009; Salm & Tessema 1998)**	

Owners and managers

Marine Protected Areas are managed by the parastatal SCMRT-MPA, the Seychelles Centre for Marine Research & Technology - Marine Parks Authority (Marine National Parks of Seychelles 2010; UNEP/Nairobi Convention Secretariat and WIOMSA 2009). Two Special Reserves – Cousin Island and Aride Island – are managed by NGOs and several others have substantial private sector input, especially Baie Ternay (Wells 2004; Jain 2010).

MCA implementation and examples

The legal and policy framework of the Seychelles permits a variety of management and resource use rights (IUCN 2004). The two NGO owned marine reserves of Aride and Cousin Island appear to satisfy the definition of a Marine Conservation Agreement. Due to a dearth of available information on Aride, only Cousin Island will be explored in more detail.

Cousin Island

Cousin Island was purchased in 1968 by the International Council for the Protection of Birds (ICBP), now BirdLife International, to save the threatened Seychelles warbler (Salm & Tessema 1998; Salm et al. 2000). In 1975, the Government of Seychelles gave it Special Reserve status and extended protection to 400m offshore all around the island (Wells 2004). Today, the reserve is managed by the NGO Nature Seychelles and is funded entirely through tourist revenues, which are sufficient to run the reserve and fund local education and conservation initiatives (Edwards &

Hooper 2009; Wells 2004; Arthuron & Korateng 2006). Total economic benefits to the local economy from Cousin are estimated to exceed USD600,000 annually (IUCN 2004).

There is one further suspected MCA at Baie Ternay, where Emirates Hotels and Resorts are constructing a luxury spa resort (Emirates 2007; Jain 2010). However, sufficient information was not available to confirm this.

Overall, it is clear from the examples above that MCAs can be and are being implemented in the Seychelles and that Nature Seychelles would be a key implementation partner in any expansion of the strategy. One possible constraint is the shortage of land available for development. Inappropriate and inefficient land use has occurred throughout the archipelago, causing erosion, deforestation, and pollution, especially in coastal regions (UNEP/Nairobi Convention Secretariat and WIOMSA 2009). It may therefore be prudent to encourage the legalisation and extension the National Land Use Plan, which would largely overcome these constraints.

TANZANIA

The coastal waters of Tanzania harbour some of the richest marine resources in the Western Indian Ocean (Salm & Tessema 1998). In recognition of this value, at the World Parks Congress in 2003, the government announced its intention to increase the percentage of MPAs to 10% by 2012 and 20% by 2025 (Ruitenbeek et al. 2005). To date, progress has been good and the 2012 target has already been achieved (UNEP-WCMC 2010). Table 17 outlines Tanzania's existing MPAs in more detail.

Table 17: Marine Protected Areas in Tanzania

Site	IUCN	Size (km^2)	Date	Governance
Saadani	--	70.00	1969	Government
Maziwe Island	II	2.60	1981	Government
Chumbe Island Coral Park	II	0.30	1991	Private
Mafia Island	VI	615.00	1995	Government
Menai Bay	VI	470.00	1997	Collaborative
Pemba Channel	--	--	2005	Government
Mnemba Island	VI	0.15	2002	Private
Misali Island	VI	21.60	1998	NGO
Kiwengwa	--	17.50	2000	--
Mnazi Bay-Ruvuma Estuary	--	200.00	2000	Government
Dar es Salaam Reserves	II	26.00	1975	Government
Tanga collaborative Management Areas	--	1598.50	1996-2000	Collaborative
Nyororo, Shungumbili and Mbarakuli	--	--	2007	Government

Sources: (Salm & Tessema 1998; UNEP-WCMC 2010; IUCN 2004; Mwaipopo 2008; Obura et al. 2004; Ruitenbeek et al. 2005; Tobey & Torell 2006; Wagner 2007; Wells et al. 2007; WWF 2004b)

Although the constitution of the United Republic of Tanzania lacks explicit provisions on environmental management and protection, the legal system has wide-ranging institutional and legislative coverage of natural resources issues, including coastal and marine resources (UNEP/Nairobi Convention Secretariat and WIOMSA 2009; WWF 2007). However, these laws and policies have been established and implemented by the two governments of the United Republic (Mainland Tanzania and Zanzibar), causing legislative overlap, friction and contradiction (UNEP/Nairobi Convention Secretariat and WIOMSA 2009; WWF 2007). As such, environmental law and policy for Zanzibar and Mainland Tanzania are discussed here separately where appropriate.

Legal and policy framework: Mainland Tanzania

Tanzania's overarching environmental legislation is the Environmental Management Act 2004 (EMA), which provides a framework for sustainable management of the environment and repeals all earlier laws and provisions that are inconsistent with it on environmental matters (UNEP/Nairobi Convention Secretariat and WIOMSA 2009). Marine Protected Areas are established under the Marine Parks and Reserves Act 1994, whereas National Parks with marine components (Saadani, for example) are gazetted under the Wildlife Conservation Act 1974 (WWF 2004b; Mwaipopo 2008). Table 18 summarises relevant policies and laws.

Table 18: Key policy and legislation relating to the marine and coastal protection in Mainland Tanzania

Policy or Law	Relevance
Policies and Frameworks	
National Environmental Policy (NEP, 1997)	Overarching national environmental policy focused on the conservation of the environment and effective use of natural resources
National Integrated Coastal Management Policy (2003)	Outlines commitment to sustainable coastal governance and champions integrated coastal management
National Wildlife Policy	Sets out simple, transparent procedures for stakeholder participation in the wildlife-based tourist industry, as well as for investment in other wildlife activities.
National Fisheries Policy	Gives priority to artisanal fishermen to help them improve their fishing methods and gear
National Tourism Policy	Aims to promote environmentally friendly tourism in protected areas. Also highlights the need for conservation of wildlife parks, reserves and other important natural areas
Legislation	
Environmental Management Act (EMA, 2004)	Overarching legal framework for the management of Mainland Tanzania's environment
Marine Parks and Reserves Act (1994)	Provides for the establishment, monitoring and management of marine protected areas
Wildlife Conservation Act (1974)	Gazettes national parks
Fisheries Act (2003)	Regulates the fishing industry, especially in MPAs
Forest Act (2001)	Designates Mangrove Forest Reserves and encourages community-based management

Sources: (Mwaipopo 2008; UNEP/Nairobi Convention Secretariat and WIOMSA 2009; WWF 2007; WWF 2004b; Hatton 2001; Kamukuru et al. 2004; Sterner & Andersson 1998)

Owners and managers: Mainland Tanzania

Responsibility for environmental management lies with the Ministry for the Environment and Human Affairs within the Vice-Presidency (Chircop et al. 2010). The Marine Parks and Reserves Unit (MPRU) of the Department of Fisheries is responsible for managing marine protected areas, whereas the Tanzania National Parks Authority (TANAPA) is mandated with establishing national parks, including marine national parks (IUCN 2004). Ten further ministries have at least partial

responsibility for marine, coastal and broader environmental issues, creating confusion, conflict and overlap (Chircop et al. 2010; WWF 2007; WWF 2004b).

Legal and policy framework: Zanzibar

In Zanzibar, the Environmental Management for Sustainable Development Act 1996 and the Forest Resources Management Act 1996 provide the legal basis for protected area establishment (WWF 2004b; Ruitenbeek et al. 2005; Salm & Tessema 1998) . The former sets out four types of protected area for Zanzibar: Controlled Areas (now known as Conservation Areas), Sanctuaries, Parks and Reserves (WWF 2004b). The latter is predominantly concerned with land-based protected areas (WWF 2004b). The 1988 Fisheries Act also permits the formation of MPAs in territorial waters (WWF 2004; Mwaipopo 2008b). Table 19 outlines pertinent policies, frameworks and legislation.

Table 19: Key policy and legislation relating to the marine and coastal protection in Zanzibar

Policy or Law	Relevance
Policies and Frameworks	
National Environmental Policy (1992)	Overarching national environmental policy focused on sustainable protection and management of Zanzibar's natural resources
Legislation	
Environmental Management for Sustainable Development Act (1996)	Overarching legal framework for the management of Zanzibar's environment
Fisheries Act (1998)	Provides for formation of MPAs in territorial waters
Forest Resources Management Act (1996)	Provides legal framework for establishment of protected areas including community-based management
Zanzibar Investment Act (1986)	Promotes Foreign Direct Investment and sets up The Zanzibar Investment Promotion Agency (ZIPA) as overarching implementing body
Land Tenure Act (1992)	Decrees that land cannot be privately owned but may be leased for a maximum of 33 years

Sources: (Mwaipopo 2008; UNEP/Nairobi Convention Secretariat and WIOMSA 2009; WWF 2007; WWF 2004B; Hatton 2001; Kamukuru et al. 2004; Sterner & Andersson 1998; Crawford et al. 2010; Salm & Tessema 1998; The Nature Conservancy & Conservation International. 2008)

Owners and managers: Zanzibar

The Ministry of Agriculture, Natural Resources, Environment and Co-operatives (MANREC) has overall responsibility for protected areas with management split on a site-by-site basis between the Departments of Fisheries and Marine Products and of Commercial Crops, Fruits and Forestry (DCCFF) (WWF 2007).

MCA implementation and examples

The legal and policy frameworks of both Zanzibar and Tanzania are amenable to MCA implementation, though more so in Zanzibar than in Mainland Tanzania (WWF 2004B). This is in part due to the complexity of Mainland Tanzania's institutional framework (noted above) and in part because Zanzibar has been less guarded about courting foreign direct investment (The Nature

Conservancy & Conservation International. 2008). It is perhaps unsurprising, therefore, that his analysis found three operational MCA projects in Zanzibar's coastal waters, but only one in Tanzania's.

Chumbe Island, Tanzania

Established in 1994, Chumbe Island was Tanzania's first MPA (The Nature Conservancy & Conservation International. 2008). It is a private marine reserve and ecotourism destination, with a 0.3km^2 area of reef managed under a 10 year renewable lease with the Government of Zanzibar (Salm & Tessema 1998; The Nature Conservancy & Conservation International. 2008). Tourist revenue covers basic management costs and local fisherman are employed as park rangers (The Nature Conservancy & Conservation International. 2008).

Misali Island, Zanzibar

Misali was founded by local communities in response to a controversial planned tourist development, and is jointly managed by the Misali Island Conservation Association (MICA) – which comprises some 700 local stakeholders – and the DCCFF (WWF 2004B). Although the Zanzibar Government covers salaries and office costs, the initiative is additionally supported by CARE International, which raises funds through tourist levies (*ibid*.). Sixty percent of these fees goes on conservation activities, with the remainder funding local community development projects (*ibid*.).

Mnemba Island, Zanzibar

Mnemba Island is a high-end ecotourism resort managed by Conservation Corporation Africa (CCA) (Lange & Jiddawi 2009; WWF 2004B). CCA has acquired rights over a certain area of adjacent ocean area with reefs and works with the Department of Fisheries to patrol and collect fees from divers in the area (Personal Communication, Eleanor Carter). These fees, together with proceeds from the lodge are reinvested in a fund for community development (WWF 2004B).

Mafia Island Turtle Incentive Payouts, Tanzania

In 2002, in response to widespread poaching of green turtle nests, WWF initiated a programme to engage stakeholders and elect turtle monitors at the Mafia Island MPA (Gjertsen & Niesten 2010). A Tanzanian NGO Sea Sense was established to train monitors and pay them to patrol nesting beaches, relocate nests, and assist with tagging and data collection (*ibid*.). The presence of the monitors was not a sufficient deterrent, however, so a direct incentive scheme was devised the following year (*ibid*.). The scheme paid members of the local community USD 3.50 per nest discovered, USD 0.07 per successful hatching and USD 0.04 per each unviable egg (*ibid*.). As a result, poaching of turtle nests dropped from 100% in 2001 to just 1.6% in 2008 (*ibid*.).

MCAs in Tanzania are thus more widespread and varied in their management approaches than elsewhere in the region. Due to the number of successful projects, it is submitted that any of the organisations noted in the case studies would be suitable implementation partners.

SOUTH AFRICA

South Africa's waters harbour about 15% of the world's marine species, a quarter of which are endemic to the country (Department of Environmental Affairs and Tourism 2009). Two thirds of South Africa's 34 marine biomes are threatened, with 12% critically endangered, 15% endangered and 38% classified as vulnerable (Driver et al. 2005; Department of Environmental Affairs and Tourism 2009). However, most of the more threatened marine ecosystems can be found along the country's west coast and are not considered part of the Western Indian Ocean region (Department of Environmental Affairs and Tourism 2009). Across the country's coastline, assessments for marine species have been a low priority and lag far behind those of terrestrial counterparts (*ibid*.). Despite these constraints, South Africa has 5 MPAs within the WIO region, covering 6.5% of territorial waters (Table 20)

Table 20: Marine Protected Areas in the WIO region of South Africa

Site	IUCN	Size (km^2)	Date	Governance type
Maputaland	IV	408.00	1986	Government
St Lucia	IV	414.00	1979	Government
Trafalgar	IV	8.30	1979	Government
iSimangaliso Wetland Park	--	2396.00	1999	Government
Aliwal Shoal	IV	124.74	2004	Government

Sources: (Salm & Tessema 1998; UNEP-WCMC 2010; IUCN 2004)

Legal and policy framework

Since the establishment of democratic government in 1994, South Africa has rapidly and extensively reformed its political and legislative framework (Department of Environmental Affairs and Tourism 2009). Several aspects of the post-apartheid constitution relate to natural resources conservation, especially section 24, which gives everyone the right to a protected environment not harmful to well-being nor health (UNEP/Nairobi Convention Secretariat and WIOMSA 2009; Barnett & Patterson 2006).

The National Environmental Management Act (107 of 1998) is South Africa's overarching framework law for environmental management (Driver et al. 2005; UNEP/Nairobi Convention Secretariat and WIOMSA 2009). The Act is founded on a number of modern principles including sustainable development, intergenerational equity, ecosystem-based management, integration, precaution, the polluter pays principle and the human right to a decent environment (Chircop et al. 2010). Protected areas are established under the National Environmental Management: Protected Areas Act (57 of 2003) and the Marine Living Resources Act (18 of 1998) which additional provides

for fisheries regulation (Department of Environmental Affairs and Tourism 2009; Driver et al. 2005; UN FAO 2007d). Table 21 summaries key policy and legislation relating to the marine environment in South Africa.

Table 21: Key policy and legislation relating to the marine and coastal protection in South Africa

Policy or Law	Relevance
Policies and Frameworks	
National Biodiversity Strategy and Action Plan (NBSAP)	Translates environmental policy goals into prioritised objectives and action plans for implementation
National Biodiversity Framework (NBF)	Sets out a consistent, coordinated and integrated approach to countrywide biodiversity management
Policy for Sustainable Coastal Development in South Africa (2000)	Promotes judicious management of marine resources and sustainable coastal development.
White Paper on the Conservation and Sustainable Use of South Africa's Biological Diversity (1997)	Emphasises importance of biodiversity conservation in sustainable resource use
Legislation	
National Environmental Management Act (107 of 1998) (NEMA)	Overarching legal framework governing environmental management in South Africa
Biodiversity Act (10 of 2004)	Part of the National Environmental Management suite of legislation. It provides for the conservation and management of South Africa's biodiversity and ecosystems
Protected Areas Act (57 of 2003, amended 2005)	Part of the National Environmental Management suite of legislation. It provides the declaration and management of protected areas as well as for co-operative governance
Marine Living Resources Act (18 of 1998)	Establishes marine protected areas and provides for the conservation of marine ecosystems, and the sustainable utilisation of marine living resources over the long term
Environment Conservation Act (73 of 1989)	South Africa's first framework environmental legislation, now largely repealed by NEMA
Integrated Coastal Management Act (2009)	Promotes an integrated and co-ordinated approach to managing the coast

Sources: **(Driver et al. 2005; Department of Environmental Affairs and Tourism 2009; Barnet**t & Patterson 2006; UN FAO 2007d**; UNEP/Nairobi Convention Secretariat and WIOMSA 2009; Borja et al. 2008; Chircop et al. 2010; Hauck & Sowman 2001)**

Owners and managers

Until recently, the remit for the administration and coordination of national environmental policy belonged to the Department of Environmental Affairs and Tourism (DEAT) (Chircop et al. 2010). In turn, DEAT largely delegated responsibility for marine protected areas to the separate Marine and Coastal Management Directorate (UN FAO 2007d). However, new government structures introduced following the 2009 elections have caused DEAT to be split into three ministries: Tourism, Agriculture, Forest and Fisheries, and Water and Environmental Affairs (Chircop et al. 2010). It is probable that each will have some responsibility for MPA development, though precise details and implications are yet to be clarified (*ibid*.).

Although administration and coordination of protected areas are national endeavours, implementation and compliance are largely delegated to the provinces (UNEP/Nairobi Convention Secretariat and WIOMSA 2009; Chircop et al. 2010). Ezemvelo KwaZulu-Natal Wildlife, for

example, manages and enforces the World Heritage-listed iSimangaliso Wetland Park on the east coast of South Africa (Chircop et al. 2010).

MCA implementation and examples

Private land ownership in South Africa is common, with half of all protected areas under private stewardship(Riedmiller & Carter 2000)Together, these reserves are credited with saving from possible extinction a number of species including the Southern white rhinoceros, bontebok, black wildebeest, Cape mountain zebra and the geometric tortoise (Cousins et al. 2008). Ownership of marine resources, however, is vested in the state: all the islands and everything below the Admiralty Line is state-owned (Personal Communication, Graham Kerley). Furthermore, all marine protected areas are managed top-down by national or provisional government (see table 20). Accordingly, the legal and political framework in South Africa is at present ill-suited to MCA implementation and this analysis was unable to find a single example of a functioning MCA.

However, there is a chance that this may change in future. The recently passed Protected Areas Act (2003, amended 2005) and Integrated Coastal Management Act (2009) include explicit provisions for co-management of protected areas (Department of Environmental Affairs and Tourism 2009; Chircop et al. 2010). This, combined with widespread private ownership of natural resources on land, may present future opportunities for MCA establishment.

CASE STUDY: NORTH QUIRIMBAS, MOZAMBIQUE

The Quirimbas archipelago in northern Mozambique is one of the most remote and unspoilt coastal areas of East Africa (Garnier 2003). Isolated for my than 30 years by the country's civil war, researchers were unable to document its conservation value until the late 1990s (Garnier et al. 2008). Ecological surveys soon indicated that the region was exceptionally biodiverse, leading to the establishment of the government-run Quirimbas National Park in the south of the archipelago in 2002 (Garnier et al. 2008). The northern fringes of the Quirimbas also received protection through the formation of the private sector-financed Maluane initiative in 2001.

Agreement mechanism

The Initiative won a concession to manage an area of 230km^2 around the islands of Vamizi, Rongui and Macaloe for biodiversity conservation and socio-economic development, using up-market ecotourism as a financing mechanism (Garnier et al. 2008; Garnier 2003). Table 22 outlines the key provisions of the agreement

Table 22: Key provisions of Maluane initiative concession

Law	Mozambican law (Resolução Interna de Conselho de Ministros Nº 13/2001)
Duration	50 years
Payments	Unknown
Concession area	Approximately 230km^2 including the islands of Vamizi, Rongui and Macaloe
Authority	Government of Mozambique
Party	Maluane Initiative
Sign date	21 December 2001

Sources: (Garnier et al. 2008; Garnier 2003)

Objectives

The Maluane initiative's objectives are six-fold:

- To protect and maintain the biological diversity and natural resources of national and international significance, as well as ecosystem processes;
- To ensure community participation in management decisions and activities;
- To promote sound management practices for sustainable production purposes;
- To contribute to the socio-economic development of local communities;

- To provide opportunities for research and education; and
- To develop up-market tourism activities that will ensure the financial viability of the Project (Garnier 2003)

To achieve these triple-bottom-line goals (economic, ecological, social), the initiative was developed as a partnership between the Zoological Society of London (ZSL) local communities and the private sector, a group of individual European investors with a strong conservation ethic (Garnier et al. 2008; WWF 2004B)

Conservation values and programmes

The coral reefs around Vamizi and Rongui are healthy, productive and show few signs of anthropogenic impact (Garnier et al. 2008). Average coral cover is almost 40% and to date, 183 species have been identified (Garnier et al. 2008). Fish surveys since 2003 have identified 401 species and have recorded large densities and numbers of carnivores typically considered vulnerable to fishing pressure (*ibid*). Endangered Green and Critically Endangered Hawksbill turtles nest on the project islands and humpback whales give birth in the area between Rongui and Vamizi (Garnier 2003). Dugongs, whale sharks and dolphins are also known to occur within the concession (*ibid*.).

Due to this obvious conservation value, the Maluane Initiative has developed a number of marine conservation programmes including: reporting of illegal fishing (especially industrial long-lining); detailed marine surveys; invasive species removal; dolphin and whale shark research projects; and a community-based turtle monitoring programme (Maluane Project 2010; Garnier et al. 2008). The turtle monitoring, which began in 2002, has proved particularly successful (Garnier et al. 2008). A local team of 10 monitors mark and protect nests, tag turtles and run awareness-raising and educational programmes (*ibid.*). To date, more than 700 nests have been protected on Vamizi and Rongui and poaching has been reduced to zero (*ibid*.).

Community-based management

Recognising that empowering local communities can be an effective means of sustainable natural resource management, the government of Mozambique legalised Fishing Community Councils (Concelho Comunitario de Pesca, or CCP) in 2006 (Cinner et al. 2009; Garnier et al. 2008). The Councils give local stakeholders rights to control access and manage marine resources within 3 nautical miles of their coastline (Garnier et al. 2008). Two CCPs have so far been legalised in the North Quirimbas: one on Vamizi Island and one in Olumbe, a village on the coast that uses Vamizi's fishing grounds (*ibid*.). The Maluane initiative is helping these CCPs build their capacity to effectively manage their resources by training members in reef monitoring and fish stock assessments (*ibid*.).

Socio-economic benefits

To ensure the long-term financial stability of the conservation and socio-economic programmes in the concession, Vamizi has been developed as a luxury ecotourism destination. In 2005, a 13-villa lodge opened on the Island, soon after receiving visits from dignitaries such as Nelson Mandela (Garnier et al. 2008; Maluane Project 2010). Every guest pays a conservation fee, the revenues from which are reinvested in the community (Garnier et al. 2008). Because of this levy, the Maluane Initiative has been able to support the development of small businesses in Vamizi and Olumbe (*ibid*.). These include a 22-farmer vegetable farm that sells fresh produce to the lodge, and a cooperative of 29 women who make crafts for and perform traditional dances at the lodge (*ibid*.). Furthermore, a newly formed alliance of 21 fishermen are being supported to use sustainable methods (*ibid*.).

CONCLUSIONS AND RECOMMENDATIONS

This report has investigated the role and feasibility of marine conservation agreements in the Western Indian Ocean nations of Kenya, Madagascar, Mozambique, Seychelles, South Africa and Tanzania. From an exhaustive synthesis of the literature and an analysis of the responses of 62 key opinion leaders in the region, it found 51 marine protected areas of varying size and governance types. Ten of these MPAs were additionally identified as marine conservation agreements and summarised accordingly, whilst a further 3 were suspected to be MCAs, but adequate information was not available to confirm this. One MCA site – the North Quirimbas concession in Mozambique – was developed into a case study.

A detailed evaluation of the laws, policies and practices relating to use and management of coastal resources in the region revealed that MCAs were a feasible strategy in four of the six countries under consideration. Kenya and South Africa are the exceptions, though this may change with the recent adoption of a new legislation in the two countries. The legal and policy frameworks in Tanzania (especially Zanzibar) and Mozambique were found to most amenable to MCA implementation with both countries supporting a variety of different agreement types. It is therefore recommended that efforts be focused primarily in these two regions, and to a lesser extent and pending key legislative reform in Seychelles and Madagascar.

In terms of potential implementers, this report identified several suitable partners. These include WWF in Mozambique and Tanzania, ReefDoctor, Blue Ventures and the Wildlife Conservation Society in Madagascar, Zoological Society of London in Mozambique, Nature Seychelles, and Chumbe Island Coral Parks, CARE International and Conservation Corporation Africa in Tanzania and Zanzibar.

Although the project has successfully identified many opportunities and issues relating to MCAs in the WIO region, it was unable to exhaustively document all existing MCAs due to time constraints. Given these information gaps, this report should perhaps be regarded only as a starting point for more focused assessments of MCA feasibility in the region.

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APPENDIX 1: INTERNATIONAL AND REGIONAL CONVENTIONS AND INITIATIVES

There is a complex and wide-ranging network of conventions, treaties, initiatives and programmes governing or endeavouring to govern protected areas and ocean use (Hatton 2001; Cater & Cater 2007; Joyner 2000). Table A1 summarises the key ones relating to marine protected areas and biodiversity conservation in the WIO.

Table A1: Key global and regional conventions and initiatives relating to Marine Protected Areas

Convention or initiative	Main focus
Legally Binding Conventions	
Convention on Biological diversity (CBD) and Jakarta Mandate	Covers sustainable use and conservation of biodiversity, including the establishment of a system of marine protected areas. The associated Jakarta Mandate sets out specific requirements for marine biodiversity conservation in five key areas including MPAs and integrated coastal management (ICM).
Convention on Wetlands of International Importance (Ramsar Convention)	Allows for designation of freshwater and marine sites (to 6m depth at low tide) of international importance. Sites require managing but are permitted “wise” use.
International Convention for the Prevention of Marine Pollution from Ships (MARPOL)	Addresses pollution of the marine environment by ships from accidental or operational causes such as ballast water discharge, solid waste, sewage and oil spills.
United Nations Convention on the Law of the Sea (UNCLOS)	Allows coastal nations exclusive jurisdiction over their inland waters, territorial seas (out to 12 nm from the coast) and Exclusive Economic Zone (EEZ) (200 nm or 370 km from the coast)
World Heritage Convention	Protects exceptional examples of the world’s natural and cultural heritage. Parties nominate sites that have outstanding values and meet specific criteria
Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Eastern African Region (Nairobi Convention)	One of the United Nations Environment Programme (UNEP) Regional Seas conventions, addressing protection of the marine and coastal environment in the Western Indian Ocean. The Protocol on Protected Areas and Wild Fauna and Flora calls for the formation of a regional programme to establish a network of MPAs. In April 2010, the parties signed a new protocol, making the WIO the world’s third marine area to attain a multilateral accord to control and limit land-based impacts on the marine environment
African Convention on the Conservation of Nature and Natural Resources	Requires parties to tackle gaps in biodiversity conservation and support the formation of community-based protected areas. Incorporates IUCN Protected Areas Management Category System
Non-binding programmes and initiatives	
World Summit on Sustainable Development Plan of Implementation	Promotes sustainable development agenda and sets numerous targets including forming representative networks of MPAs by 2012, restoring depleted fish stocks by 2015 and applying the ecosystem approach to marine management by 2010
UNESCO Man and the Biosphere Programme (MAB)	Encourages conservation of biodiversity by enhancing the relationship between people and their environment. At the heart of the programme is an initiative to establish a global network of biosphere reserves
FAO Code of Conduct for Responsible Fisheries	Provides advice on how to manage fisheries sustainably and recommends protection of all vital fisheries habitats.
African Protected Areas Initiative (APAI)	Recommends local community involvement in protected area management systems and transparency. Urges the establishment of areas that adequately protect all threatened species and are representative of all ecosystems
International Coral Reef Initiative (ICRI) – regional strategy	Promotes the formation of a comprehensive, representative and effective network of MPAs in the Eastern African region
WWF Eastern African Marine Ecoregion (EAME) Programme	A partnership initiative focussing on large-scale conservation, sustainable use of marine resources and MPAs in continental East Africa

Sources: (Cater & Cater 2007; IUCN 2004; Kimball 2003; Chircop et al. 2010; Salm et al. 2000; WWF 2004B; Gaspar 2010; ; WWF 2004B; Hatton 2001; Guerreiro et al. 2010; Wells et al. 2007; United Nations 2008; UNEP 2007; UNEP/Nairobi Convention Secretariat and WIOMSA 2009)

The seven legally binding conventions noted above have been adopted by all five states under consideration, except for the World Heritage Convention, which has not been ratified by Kenya or Seychelles (African Union 2010; UNESCO 2010; United Nations 2010; International Maritime Organisation 2010; The Ramsar Convention on Wetlands 2010; Convention on Biological Diversity 2010; UNEP/Nairobi Convention Secretariat and WIOMSA 2009). Along with Mozambique, The Seychelles has also failed to ratify the African Convention on the Conservation of Nature and Natural Resources (African Union 2010).

There are also several programmes and conventions that are important for the conservation of marine biodiversity but do not directly pertain to MPA formation or management (IUCN 2004; Cater & Cater 2007). These include

- The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES);
- The Convention on the Conservation of Migratory Species of Wild Animals (CMS or Bonn Convention);
- The Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA);
- The UN Framework Convention on Climate Change (UNFCC); and
- Small Island Developing States (SIDS). (IUCN 2004; Joyner 2000; Kimball 2003; Abensperg-Traun 2009).

APPENDIX 2: THREATS TO MARINE BIODIVERSITY: UNDERLYING CAUSES

In addition to the direct threats outlined in Chapter 2, there are numerous political, economic, social and cultural factors that underlie decisions to use a resource (WWF Eastern African Marine Ecoregion. 2004a).

POVERTY AND LACK OF ALTERNATIVES. In the WIO region, poverty is probably the primary underlying cause of degradation of marine resources (WWF Eastern African Marine Ecoregion. 2004a). Rising regional populations have accelerated fishing effort, substantially increasing pressure on fish stocks. (Cesar et al. 2003; Borja et al. 2008). With fewer fish to catch and more mouths to feed, fisherman have turned to more efficient but extremely damaging methods like blast and cyanide fishing (Buddemeier et al. 2004; Cesar et al. 2003). Substandard education and health provision in the poorest communities often exacerbate this situation (WWF Eastern African Marine Ecoregion. 2004a). The inadequate infrastructure, absence of alternatives and prohibitive costs for travel (badly maintained roads, infrequent services and limited freezing or post-harvest treatment facilities) all contribute to maintaining this destructive cycle (*ibid*.).

LACK OF SUSTAINABLE CONSTRUCTION MATERIALS. In many parts of the WIO, extraction of construction materials continues to degrade shallow-water coral reefs (Buddemeier et al. 2004). Use of sustainable alternatives such as kiln-baked mud bricks and poles from sisal and Casuarina is slowly starting to increase, but has been hampered by lack of government incentives and relevant, properly enforced legislation (WWF Eastern African Marine Ecoregion. 2004a).

LACK OF OWNERSHIP OF MARINE RESOURCES. The general lack of local ownership of coastal resources and thus of any stewardship incentive or motivation often results in a failure to adequately protect coral reefs, mangrove forests and intertidal habitats (Arthuron & Korateng 2006; WWF 2004a). As such, and although this does not necessarily guarantee sustainable resource use, a much wider adoption of local management is needed (Chircop et al. 2010; Cinner & Fuentes 2008; Cinner et al. 2009; WWF Eastern African Marine Ecoregion. 2004a).

INADEQUATE INSTITUTIONAL CAPACITY. While all of the countries under consideration have functioning MPAs, many of these lack adequate management and enforcement due to insufficient financing, lack of technical ability and corruption (Salm & Tessema 1998; WWF Eastern African Marine Ecoregion. 2004a; Sims-Castley et al. 2005; Hewawasam 2000). Other MPAs have not progressed beyond the proposal stage or have been established then quickly forgotten the seven marine reserves in Tanzania that were gazetted in 1975, for example) (Salm & Tessema 1998).

INADEQUATE LEGISLATION AND INSTITUTIONAL OVERSIGHT. Legislation for MPA establishment exists throughout the WIO, but it is often weak or not well supported (WWF 2004a; WWF Eastern African Marine Ecoregion. 2004a). Furthermore, various government ministries and departments are often mandated to enforce the legislation, which can cause confusion, and reduce attention on environmental issues, accelerating biodiversity loss (WWF Eastern African Marine Ecoregion. 2004a; Hatton 2001).

LACK OF MULTINATIONAL COOPERATION. Biodiversity is not constrained by national boundaries, so it can be threatened by insufficient multinational collaboration (Salm & Tessema 1998; IUCN 2004; Guerreiro et al. 2010). For example, turtles nesting along the Tongaland coast of South Africa are safeguarded on their nesting beaches but they move to feeding grounds off Mozambique, Tanzania, and Madagascar where they are harvested due to inadequate protection (Salm & Tessema 1998).

PUBLIC APATHY. Throughout the region, there is a general apathy towards and lack of awareness of marine conservation issues (Salm & Tessema 1998). Consequently, MPAs are often afforded low priority for funding and little government support (Salm & Tessema 1998; Carter et al. 2008)