

The Chumbe Island Coral Park Project: Management Experiences of a Private Marine Conservation Project

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Abstract

Chumbe Island Coral Park (CHICOP) in Zanzibar, Tanzania, is a rare example of a small but increasing number of privately created and managed protected areas operating in an often difficult institutional and legal environment. Over six years the project has invested heavily in the conservation of Chumbe Island and has made exceptional achievements in establishing it as an efficiently managed protected area, providing significant educational benefits. It is the only existing marine protected area in Zanzibar and was the first established in Tanzania.

This paper analyses the background and history of the project and describes management experiences, problems and achievements in the legal, political and institutional environment of Zanzibar, Tanzania; a country which after Independence embraced a socialist development model and only recently encouraged private investment.

Private Protected Areas – A Promising Conservation Management Model?

In spite of their considerable economic potential through tourism, the sustainable management of nature reserves by central government agencies has proven difficult in many African countries because of institutional weaknesses and because proceeds from tourism are normally not re-invested in the reserve management and related services. In addition, government nature reserves often suffer from conflicting interests between different user groups, particularly traditional users and tourism.

One attempt to overcome these problems are project designs aimed at the devolution of authority for wildlife conservation to local communities. While these are increasingly favoured by donor agencies and attract considerable funding, government agencies still find it difficult to actually transfer authority and funds to local levels, while local communities are found to have limited management capabilities, particularly where there is no tradition of resource management (Scheinman & Mabrook 1996). As a consequence, privately managed protected areas are now beginning to be acknowledged as an alternative. Indeed, new environmental legislation in Zanzibar, as elsewhere, specifically allows for protected area management powers to be delegated to private bodies.

A recent survey commissioned by the World Conservation Monitoring Centre (WCMC) in selected African countries (Watkins et al. 1996) reviewed private initiatives where 'wildlife conservation is a primary activity'. The rather surprising finding is that more than half of all protected areas in the South African Republic are under private ownership and management, while Namibia, Botswana and Kenya also have a considerable number of private protected areas. Generally, 'countries which have had free-market economies for a long time and in which the purchase of freehold property is permitted, have attracted private individuals and corporate bodies to invest in conservation-oriented initiatives'. (p.6).

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The study concluded that 'the private sector makes an invaluable contribution to biodiversity conservation', and that 'private protected areas provide a variety of important conservation and other services. These include providing safe havens, the breeding of endangered species in the wild for subsequent re-introduction, ecological tourism and sustainable use of wildlife' (p.4). In some cases, the conservation role of private protected areas is crucial for the survival of particular endangered species. The overall conclusion is that 'there is much to learn from the private sector, particularly with respect to the economies of managing protected areas through sustainable use of wildlife resources, ecotourism and other enterprises' (p.6).

Though endowed with a wealth of natural resources that have a high conservation value, Tanzania has so far not attracted private investment in conservation. Two decades of socialist policies and large-scale expropriations of land, enterprises and private houses have resulted in a near collapse of the economy and made the country highly dependent on donor funding. This was compounded by the fact that tourism was not encouraged until recently and the revenue potential of conservation areas could not be realised. However, changes in international donor policies from the eighties have made economic realities and sustainability an issue, and Tanzania is now undergoing policy reforms towards a more liberalised economy. Private investment is encouraged in general and tourism is expected to become one of the leading economic sectors in the country, while ecotourism is the buzzword of the day.

On the conservation side, Tanzania traditionally has a well-established system of world-renowned terrestrial protected areas, while the several marine parks designated along the coast in the early seventies remained on paper only (Jameson et al. 1995). In these, rampant dynamite fishing and other destructive fishing methods have damaged many coral reefs, probably beyond recovery (UNEP-RSRS 1989).

Encouraged by both the more liberal investment climate and the need for investment in marine protection in particular (and being a passionate diver, sailor and amateur marine biologist herself), the initiator of the Chumbe project decided to establish a small private marine park project where the profits from a tourism operation would sustain conservation management and environmental education for local people. After concluding a consultancy on environmental education in Zanzibar commissioned by FINNIDA and the Department of Environment in 1990/91 (and with fifteen years—eight of them in Tanzania—of project management experience with a major bilateral aid agency) the project initiator undertook to search all around the reefs of Zanzibar for several months to find a suitable area for a small private marine park project. The project initiator opted for Chumbe Island, as it was uninhabited, had a relatively undisturbed environment and little evidence of extractive activities.

Chumbe Island

Chumbe Island is a small coral island of approximately 16 ha situated eight miles south-west of Zanzibar town close to the shipping channel to Dar es Salaam. The island was not included in the National Marine Park System proposed by the Institute of Marine Sciences of the University of Dar es Salaam (Ngoile 1989), nor in any other such proposal. Therefore, it is unlikely that it would have been made a conservation area without the private initiative and investment to create the park. In 1991, Chumbe probably had no more conservation value than the several other islets surrounding Zanzibar, though conditions for conservation appeared more favourable for the reasons given below. Based on the initiative of Chumbe Island Coral Park Ltd. (CHICOP), a company created in 1992 for the establishment and management of the reserve, the Chumbe Reef Sanctuary was gazetted in December 1994 under provisions of the *Zanzibar Fisheries Act 1988*, and is now a fully managed conservation area.

On its western shore, Chumbe Island is bordered by a fringing coral reef of exceptional biodiversity and beauty. Scleractinian coral cover and species diversity are among the highest in the Region, and the reef has at least 90% of all the species that have ever been recorded from the whole of eastern Africa (Veron, letter dated 27 March 1997). Over 370 species of fish belonging to 50 families have been recorded including giant groupers *Epinephelus lanceolatus* (up to 1 m in length) – a rare occurrence in shallow reefs, as well as 16 species of butterflyfish – a coral feeder which is thought to give a good indication of coral quality and diversity (Mildner-Fiebig 1995). Despite incidents of seasonal coral bleaching occurring mainly during the months of March and April, and considerable storm damage in 1994 and 1997, the reef has so far always fully recovered within a couple of weeks up to a year. A massive coral spawning of mainly *Acropora* species was observed in November 1994 (Mildner-Fiebig 1995).

Most of Chumbe Island is covered by an undisturbed coral rag forest, an ecosystem of probably high conservation value that is little researched and rapidly diminishing elsewhere in Zanzibar and Tanzania (Beentje 1990). Bird surveys conducted by CHICOP in 1993 and 1994 have recorded 45 species, including several first records for Tanzania and Zanzibar, e.g. the Arctic Skua *Stercorarius parasiticus* and Pomarine Skua *S. pomarinus* (Koehler 1994), and others that are no longer seen in Zanzibar because of the predominance of the Indian House Crow, a scavenger bird introduced approximately one hundred years ago. The rich fish life attracted a large breeding population of the rare Roseate Terns (*Sterna dougalli*) in mid-1994, a noted event in ornithological circles (Iles 1995). An ornithologist working with CHICOP ringed about 200 nestlings before they left Chumbe Island.

The island has also become a refuge of the rare Coconut Crab *Birgus latro* which is abundant there, but threatened elsewhere in the Indian Ocean as it is widely eaten and used in fish traps. In late 1997, CHICOP in cooperation with the Commission of Natural Resources, started a sanctuary in the Chumbe forest for the endangered and endemic Ader's duiker (*Cephalophus adersi*) as they could not be protected from poaching in the Jozani forest. This is now supported by the WWF as an 'insurance strategy' for species survival, and it is planned that after successful breeding on Chumbe Island some animals will be transferred to Jozani forest to restock the population there, once management is more effective.

Institutional Set-Up of the Nature Reserve Management

The Government of Zanzibar approved the project as a tourism investment based on the provisions of the *Zanzibar Investment Protection Act 1986*, and gave CHICOP the lease of the project site on Chumbe Island. After commissioning ecological baseline surveys on the flora and fauna and thus establishing its conservation value, CHICOP negotiated the conservation of the island and the Chumbe Reef Sanctuary was gazetted as a protected area in 1994. Simultaneously, CHICOP was given management contracts for the whole of the island and the reef sanctuary.

To facilitate a relationship with stakeholders in conservation, and with the valuable assistance of the Institute of Marine Sciences of the University of Dar es Salaam, an Advisory Committee was established. This was formed by representatives of the Ministry of Agriculture, Livestock and Natural Resources, the Department of Environment, the Institute of Marine Sciences and the leaders of neighbouring fishing villages. The Committee meets once or more per year and is typically a forum for discussion of the Management Plan, progress reports and any problems coming up over the year. The last such meeting in November 1997 was held on Chumbe Island and chaired by the Principal Secretary of the Ministry of Agriculture, Livestock and Natural Resources. In addition, several joint programs were conducted with different government departments, e.g. a rat eradication campaign done jointly with the Plant Protection Division in 1997, and excursions of school children to Chumbe Island organised through environmental school clubs under the Department of Environment, e.g. as part of the activities for the International Year of the Reef 1997.

Presently ongoing and planned joint research programs with the Institute of Marine Sciences are dealing with coral recruitment, coral transplantation, temperature and tidal current measurements, coral reef monitoring, fish population dynamics and other topics. Research applications are normally channeled through the Institute of Marine Sciences, and have to follow the research regulations spelt out in the CHICOP Management Plan 1995–2005. According to these regulations, priority is given to research that is essential for the conservation of the reef, the forest and of notable species, and only non-destructive and non-extractive methods are allowed.

Management Plan 1995–2005 and Operations

From the beginning the conservation management of Chumbe Island followed common practice of donor-funded conservation projects. While this reflects the genuine commitment of the management to conservation (and the professional background of the project initiator), it has also helped to raise the project's credibility among some government departments and the donor community that supported several program components.

A Management Plan was produced in 1995 by consultants contracted for three months by CHICOP (funded by BESO) who had previous experience of managing a tropical island nature reserve (Aride Island, Seychelles). They held extensive meetings with a wide variety of stakeholders, including CHICOP staff, all concerned government departments and representatives of other environmental projects, local fishermen and private diving companies.

The comprehensive document includes information collected so far by the baseline surveys, on the physical, biological and cultural features of Chumbe Island, specifies aims and objectives and prescribes detailed management actions based on these. The appendices propose a management policy for sustainable development, a research policy, safety and health regulations for staff and visitors, and guidelines for visits as well as a division of responsibilities of essential personnel. In summary, the Management Plan specifies that only non-consumptive and non-exploitative activities are permitted in the Sanctuary area (including activities relating to education, research and tourism).

The government responsibilities outlined in the Plan (and based on the previously signed Management Agreements) are mainly related to public announcement of all legal and regulatory measures concerning the reserve and their enforcement through the relevant organisations (Fisheries officers, Navy, Marine police, Courts of Law), while CHICOP has full managerial and financial responsibility for Chumbe Island.

The Management Plan was endorsed by the Advisory Committee and is now the basis for project operations. The following program components were implemented between 1992 and 1997:

- baseline surveys and species lists on the island's flora and fauna (from 1992, ongoing);
- negotiations to get the Chumbe Reef Sanctuary gazetted (up to 1994);
- production of the Management Plan (1995);
- employment and training of park rangers (from 1992);
- establishment of forest and marine nature trails (from 1993);
- procurement and production of educational material (from 1993);
- eradication of rats *Rattus rattus* (1997);
- establishment of a sanctuary for the endangered Ader's duiker *Cephalophus adersi* (from 1997, ongoing);
- rehabilitation of the lighthouse keeper's house as Park HQ/Visitors' Centre (to be concluded in mid-1998); and
- construction of seven visitors' 'eco-bungalows' (1995–1997).

Most of the above project activities have been concluded successfully, several with some donor support, others funded privately. The Chumbe Island Nature Reserve is now registered with the World Conservation Monitoring Centre in Cambridge (UK) and recognised as a private conservation area which offers a diverse and attractive visitors' programⁱ. Chumbe Island will by mid-1998 start full operations as an ecotourism destination. CHICOP has also been chosen as an innovative conservation project implementing Agenda 21 for presentation at the EXPO 2000 World Exhibition.

Management Experiences

At the time when Chumbe Island was chosen by the project initiator in 1991, it was uninhabited and seemed to face little immediate threat. Similar to other historic sites in Zanzibar it appeared an abandoned place with signs of passed glory, such as an old lighthouse built during colonial rule in 1904, and other ruined historical buildings. A lighthouse keeper was still on the payroll of the Harbours' Authority but had not been residing on the island for decades. Fishing was traditionally not allowed on its western side, as small boats would have obstructed vessels plying the shipping channel to Dar es Salaam, and also because the whole area surrounding the island was a military area where the army routinely conducted shooting range exercises from the adjacent Chukwani coast. In addition, few boatmen could then afford an outboard engine to go to this most distant of the islets surrounding Zanzibar town. Therefore, conditions appeared quite favourable for the establishment of a protected area there, as no traditional users were displaced and had to be incorporated or compensated.

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However, with the advent of liberalisation from the early 1990s things changed rapidly in Zanzibar. The booming tourism industry took possession of the most attractive sites (some apparently for speculative reasons) and also created a rapidly growing market for marine products, leading to over-exploitation of lobsters, kingfish and other upmarket seafood. High prices made fishing an attractive occupation for urban youths who had little respect for traditional fishing grounds and the more conservative traditional fishing practices, and who could also afford modern propulsion and fishing gear. Destructive fishing methods, such as dynamite and 'kojani' or 'kigumu' fishing (smashing corals to scare fishes into nets) are widespread in the region (Horrill 1992; Guard 1997).

Therefore, challenges to the management of the area increased during project implementation, particularly for a private initiative that could not count on the enforcement machinery of the Government. Although the Government of Zanzibar had gazetted the reef sanctuary in 1994, and Management Agreements obliged Government to assist with enforcement, this was in actual practice entirely left to the park rangers employed, trained and equipped by CHICOP. However, the protection of the conservation area on site turned out to be a minor challenge the CHICOP management had to face, compared with the demands and bureaucratic requirements posed by the different Zanzibar Government departments.

ON-SITE MANAGEMENT EXPERIENCES OF THE REEF SANCTUARY 1993–1997

Since CHICOP was created in late 1992, former fishermen from adjacent villages have been employed and trained as park rangers and stationed on the island to ensure that the protected area of the reef is not disturbed by fishing activity. From 1993, CHICOP has engaged resident volunteer marine biologists and educationists to train the rangers on the different aspects of their work. Throughout this time the rangers have made daily monitoring reports of the activities within the protected area. This chapter analyses those reports from 1993–1996, and other evidence to date.ⁱⁱ

The data gathered from these reports are unique as they give a daily account of the hands-on management of a small island environment and provide detailed information on methods used to deal with external pressures on the protected area. It has been possible to calculate accurately the number of incidents of fishermen breaching the boundaries of the protected zone from the very beginning of the project. With these data it is possible to assess trends in fishing pressure seasonally as well as trends in the origin of the fishermen, their vessel types and their target catches over time. In addition, the fishermen's reactions to the rangers doing their job have also been meticulously recorded.

Methods Used by the Rangers

At least one outboard motorboat is permanently anchored by Chumbe Island so that in the event of a vessel entering the protected area, the rangers have the means to go to the vessel concerned and speak directly to the fishermen. The ranger first informs the fishermen of the protected status of the Chumbe Reef Sanctuary. Many fishermen, unaware of this information, will obligingly exit the protected zone immediately. However, the majority of fishermen are already aware of Chumbe Island's status. The ranger then explains to the fishermen the importance of coral in providing breeding areas and protection for juvenile fish in order to replenish fish stocks in the area. He explains that contrary to the widely held belief that coral, or 'mawe na miamba' in Swahili (literally meaning 'stones and rocks'), is inorganic and lifeless, coral is in fact made up of colonies of fragile living organisms. The ranger will then inform them of the objectives of CHICOP as the managing body responsible for Chumbe Island, which includes providing environmental education to local schoolchildren and other visitors.

In spite of the violent nature of some fishing methods used by a number of fishermen they have to confront, the CHICOP rangers carry no weapons and have limited powers of enforcement. They can only try to convince the fishermen verbally, and may report frequent offenders to the CHICOP management, who in turn has in only one case (despite numerous attempts) been able to get the police to issue a warning to the offender. Surprisingly enough, it can be said that good relationships have developed over the years between the rangers and some of the local fishermen, and in some cases personal respect for the rangers has contributed to deterring attempts to fish in the protected zone. As a matter of fact, fishermen requiring assistance are never turned away, which has also contributed to the success of the protected area management, as shown below.

Trends in Anchorage and Fishing Activity in the Reef Sanctuary

Data extracted from the rangers' daily monitoring reports from 1993 to 1996 and continuous information thereafter demonstrate a clear decline in the total number of incidents over time, particularly from 1995, suggesting the overall success of the rangers' methods in deterring activity within the protected area.

However, the decline was not gradual. Confirming our prior assessment that Chumbe has not been a preferred fishing area, incidents were few throughout 1993, the first year of patrolling, with not more than between two and ten per month. However, these incidents increased drastically between November 1993 and March 1994 (with a peak of 43 incidents in March 1994) and again between July 1994 and February 1995 (with a peak of 19 in October 1994). After that, and up to the present, the number of monthly incidents is between zero and not more than eight.

The rangers explain some of the distinctive peaks in 1994/95 with the months of Ramadhan. Approaching Ramadhan fishing pressure increased as fishermen prepared for the fasting month by increasing catches to sell in order to buy goods such as quality food, clothes and gifts for this period. Others used the protected area for anchorage in the evening to prepare their food and break their fast. During this time the rangers have noted that there is also a proportionately greater number of fishing attempts at night as fishermen tried to avoid detection, but also because many fishermen will not enter the seawater for religious reasons during the days of fasting. However, there also appear to be other reasons why pressure was particularly high during these years, as indicated below.

The Fishermen's Responses to the Rangers

By analysing the rangers' monitoring reports it was also possible to crudely gauge the attitudes of the fishermen and the changes in attitude over time. When approached by the rangers the fishermen reacted in a variety of ways, but for the sake of analysis these have been categorised into four responses: a, b, c and d.

The numbers of fishermen falling into *category (a)* have remained low (between 1 and 14% of all cases) in the four years from 1993 to 1996. These fishermen claimed that they were not aware of the protected status of Chumbe and obligingly left the protected area with no trouble. *Category (b)* covers the fishermen who knew the status of Chumbe but tried to fish and/or anchor irrespective of this. Often they would simply leave the area when they saw a ranger approaching, or they would sometimes state that they were not in agreement with the prohibitive actions of the rangers, but would ultimately leave on amicable terms without causing trouble. From 1993 to 1996 the percentage of fishermen reacting in this way ranged from a high 66% in 1993 to a lower 42% in 1994 (with median figures for the other years). This was the most common reaction in the years 1993, 1995 and 1996. When verbal contact was made, the comments made by the fishermen included some individuals claiming they had been given express permission to fish these waters by the Department of Fisheries, and others complained that as citizens of Zanzibar they should have the right to fish or anchor wherever they desire.

The next category, *category (c)*, comprises fishermen who were aware of the protected status of Chumbe but who were angry about being unable to fish and/or anchor in these waters. Their reactions ranged from annoyed and verbally abusive to threatening violence. This kind of response reached a high 49% of all cases in 1994, with the vast majority of aggrieved fishermen originating from Malindi (Zanzibar town), and who were also responsible for the very high number of incidents during some months in 1994 and 1995, as mentioned above. It appears that there were organised attempts by this particular group to challenge the status of the park, with sometimes as many as 15 boats dropping anchor in the protected area at a time. At one point the permanent moorings provided for the fishermen were deliberately sabotaged to encourage anchoring within the protected area. On a few occasions the rangers' lives were threatened, but no physical attacks were ever recorded. It is worth noting that the majority of these fishermen were not looking to fish in the protected waters, as traditionally this area was not fished by vessels from this region.

There is evidence of political factors influencing the behaviour of this particular group from the Malindi area. They sometimes stated that CHICOP had no right to enforce the protected status and claimed that they enjoyed high-level political support.ⁱⁱⁱ However, infringements by people from the Malindi area also decreased drastically, particularly after the general elections in late 1995, and the number of responses in category (c) decreased to 14% in 1996.

The responses of the fishermen in the final category, *category (d)*, are recorded as those individuals who were aware of the protected status of Chumbe but believed themselves to be fishing outside of the boundaries of the reserve. An ongoing dispute exists between certain fishermen concerning the delineation of the protected area, but the proportion of fishermen in disagreement over this is very low at only 2% of all incidents in 1996. They also claim support from the Department of Fisheries.

Finally, through analysing these daily reports it has been found that the Chumbe rangers gave assistance to over 110 vessels between the years 1993 and 1996. These vessels carried between 2 and 20 fishermen at a time and the kind of help given by the Chumbe rangers included: fixing broken sails, engines and the like; providing food, water and refuge from bad weather; providing use of the radio; and fixing leaking and sinking boats. No vessel is ever turned away by the Chumbe rangers who will go out of their way to provide assistance wherever possible.

OTHER MANAGEMENT EXPERIENCES

Bureaucratic Delays Multiplying Costs

The initiator of CHICOP took interest in Chumbe because of its natural environment and its potential value as a nature reserve that could be sustained by ecotourism. Therefore, several years of pre-operational investment had to be spent in patiently and tenaciously exploring legal possibilities for the protection of the island, in campaigning for this in a politico-administrative environment which did not welcome such initiatives, and in negotiating a project design which served this purpose.

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The option to preserve Chumbe Island without any infrastructure development did not exist in 1991, as Zanzibar had no policy or legal framework for conservation areas until recently (1997), and has not yet established a government body for the management of protected areas. Before 1995, there was also no legal possibility to establish non-government organisations. Therefore, for approval, a private conservation project had to be presented primarily as an investment in permanent tourism facilities.

This had important financial implications. The official investment policy in Zanzibar favours high investments in large tourism projects (for foreign investors the minimum is now US\$4 million), that is hotel projects with 'luxurious' multistorey, airconditioned buildings typical for multinational hotel chains, such as Sheraton, Serena etc. The Government of Zanzibar would lease land only to projects that erected 'permanent' structures, and leaseholds of projects that fail to do so are revoked after some years to avoid land speculation. The makuti (palm thatched) roofs preferred for hotel projects by many developers are discouraged, and tented camps, an increasingly popular low impact investment in mainland Tanzanian game parks, are also not approved in Zanzibar. In this context, the Chumbe Island project became a challenging case of a private investment in creating and managing a conservation area that combines the advantages of more efficient private management with the revenue potential this appears to have in a growing tourism market.

With the decisive support of the Department of Environment, negotiations were conducted from 1991 to 1995 with the government departments concerned, and with three fishing villages adjacent to Chumbe. Altogether seven different government departments with ambiguous and sometimes divergent policies were involved in the process.

In late 1992, the project was finally approved by the Zanzibar Investment Promotion Authority (ZIPA) and CHICOP was registered as a limited company for the management of the future reserve. Negotiations for the gazettal and the Management Agreements for the fringing reef and the forest took another two years. In the absence of legal provisions for conservation, a clause of the *Zanzibar Fisheries Act 1988* provided the legal justification. Building permits and purchase of the ruined former lighthouse keeper's house from the Port Authority were finally concluded in late 1995 and building operations could start, more than three years after the investment had been approved. However, conservation measures on site were taken immediately after approval of the project in 1992, with the employment of park rangers and a marine biologist resident on the island.

Indeed, even after approval by ZIPA, the innovative design of CHICOP has complicated project implementation to an extent that commercially oriented investment would not have accepted. The negotiation of the preparatory steps, such as land lease, building permits, gazettal and management agreements for the conservation area, as well as research permits for scientists and project staff, took several years to conclude, delays which the investor was not prepared to avoid by paying bribes. The very substantial bureaucratic delays have more than tripled implementation time from two to seven years and this has multiplied costs, from an original estimate of about US\$250 000 in 1991, to an actual expenditure of more than four times that amount. Approximately 60% of this was spent on conservation, education and research, while the remaining 40% funded the construction of visitors' accommodation.

Up to the present, some government departments regard CHICOP as just another tourism venture, while the activities and achievements on the conservation side are only beginning to receive official support and recognition within the country. Despite the fact that a very large part of the investment funds and time was spent on the conservation of Chumbe Island and its establishment as a managed protected area, CHICOP enjoys no favoured status or exemption from the very substantial, and ever increasing costs of land rent, licences, permits, fees and taxation, which now reach a minimum fixed amount of US\$10 000 per year; this corresponds to about a third of the operational costs.

Innovative Eco-Architecture and Logistical Difficulties of Developing an Island

Other challenges resulted from the very innovative architectural design of the Park HQ and the visitors' accommodation, as well as from the difficult logistics of developing an island. Energy and water supply and waste disposal on Chumbe Island are based on the state of the art of building in nature reserves. Solar panels and rainwater catchment provide energy and water. Waste and sewage disposal are particularly important in sensitive coral areas. The installation of compost toilets instead of flush toilets not only reduced the water consumption, but also avoided any sewage run-off into the sea. Greywater from showers is recycled through sand filters and garden irrigation. These systems were not only unknown to local builders and craftsmen, but there was also little experience available on their functioning under tropical island conditions.

Chumbe Island consists of fossil coral rock and has no source of fresh water. Therefore, excavations were hardly possible, and sand, water and all other building materials had to be transported to the island, which is surrounded by reefs and has no permanent landing site. In addition, from 1994 to 1997 Tanzania and Zanzibar suffered from a regular energy crisis that created shortages of fuel and cement on the local market for extended periods. All these factors complicated the building process and contributed to enormous delays. Altogether building operations lasted four years instead of the one year originally planned by the architects, which also increased costs considerably.

Tapping the Ecotourism Market for Revenue Generation

Based on the high values placed on unspoiled and pristine destinations in the tourism market, the economic viability of the Chumbe Island project was assessed to be good in the feasibility study produced in 1991 and updated in 1994, and in a study on tourism in Zanzibar that was commissioned in 1995 by the International Finance Corporation.

However, revenue expectations also had to be corrected. Here, the lesson learned is that income from ecotourism is by no means automatic even when tourism is booming, as is the case in Zanzibar. The principal reason for this is that all activities in conservation (e.g. Jozani forest, Menai Bay, Misali Project etc.) are donor-funded, with little or no management costs passed on to visitors. As a consequence, individual tourists and tour operators can visit most local nature destinations at very low cost.

What is happening on the ground is the following. As elsewhere, the tourism market is split between backpackers coming to the country individually, and an increasing number of up-market tourists brought by international tour operators and their local agents with a prepaid package program. Backpackers opt for low-cost destinations, while international and local tour operators also prefer taking well-paying up-market tourists to unmanaged areas, or areas managed by donor-funded projects, at little cost to the operator.

From 1997, CHICOP started offering day excursions to the island for US\$50 per person, which includes boat transfers, guidance through the marine and forest trails by the park rangers, hire of snorkelling gear and a full meal and drinks. However, few travel agents have shown interest in this, as they would only get commission when sending clients to Chumbe Island. It is more profitable for them to organise island trips themselves (sometimes charging similar or higher rates) to Prison and Bawe islands for example, where no management costs occur.

Thus it can be said that CHICOP is facing 'unfair competition' from unmanaged nature destinations and donor-funded projects that subsidise conservation. The lesson learned after experimental operations over one year is that local marketing of Chumbe Island has only a limited potential for generating the income needed to sustain a professionally managed reserve and to subsidise environmental education for local people.

Benefits to Stakeholders

The Chumbe Island Coral Park project provides crucial conservation services to the population of Zanzibar, including fishermen, schoolchildren and the population in general. The project:

- **has secured continued protection of valuable flora and fauna**, in the absence (or inability) of government agencies to do so. Zanzibar had no effectively protected areas, and has to date no institutions to manage them.
- **helps restocking of locally depleted fisheries and promotes recovery of degraded coral reef ecosystems**. Chumbe is located upstream of the most important fishing grounds opposite Zanzibar town. The sanctuary provides a protected breeding ground for fish, corals and other species which then spread out to recolonise nearby over-fished and degraded areas.
- **contributes to biodiversity conservation and ecological restoration**, by effectively protecting a coral reef which holds at least 90% of the scleractinian coral species ever recorded in East Africa and an undisturbed reef flora and fauna, which allowed successful breeding of rare migrant birds, e.g. the Roseate tern *Sterna dougalli* (in 1994). Chumbe also harbours a large population of the rare Coconut Crab *Birgus latro* and offers a breeding ground for the endangered Ader's duiker *Cephalophus adersi*, which can later be reintroduced to other conservation areas, once these are established and managed effectively. In particular, after the successful eradication of rats (*Rattus rattus*) in 1997, Chumbe Island is also a safe haven for yet unknown flora and fauna typical of intertidal reef flats and coral rag forests which are little researched and rapidly diminishing elsewhere in Zanzibar and Tanzania.
- **provides a training ground for local people in conservation area management**. Since 1992 five former fishermen have been trained in marine park management and monitoring techniques for the reef and the forest. They have also learned English and gained the knowledge needed to guide both local and foreign visitors on the island. More park rangers can be trained by the project, to be posted to similar projects in the region.
- **helps create environmental awareness among fishermen** of adjacent villages who have over the years been convinced by the park rangers (former fishermen themselves) to understand the rationale of a marine protected area, to respect the boundaries of the Reef Sanctuary, and in exchange enjoy increased fish harvests in the vicinity. This has been particularly successful, as over the last two years infringements of the park regulations have become rare.
- **gives permanent help to local fishermen in distress**. As there is no maritime rescue service available in Tanzania, the assistance given by the Chumbe rangers to fishermen during rough weather, and when boats, engines and sails need fixing, is crucial. They also provide radio communication from the island to anyone in need.
- **provides a direct source of income to local fishermen**. Local fishermen will also benefit directly by selling fish and other seafood to the island restaurant once tourism visits are more regular on the island.
- **contributes to capacity building of government staff** from different departments who have been involved in the Advisory Committee and dealt with important issues concerning the establishment and management of the reserve, particularly through the discussions preceding the approval of the Management Plan 1995–2005. During the recent rat eradication campaign, staff of the Plant Protection Division and a trainee supported by the EC-funded EDG conservation project in Zanzibar have been trained on the technicalities of rodent control in nature reserves, and did a similar job on another island proposed for protection (Misali Island in Pemba).
- **has created unique facilities for environmental education** for school children and other visitors. Nature trails and educational materials (in Kiswahili and English) have been developed in the forest and on the reef and, since 1994, several excursions of school children have been organised through the Department of Environment based on the initiative of a VSO-volunteer responsible for environmental clubs in schools cooperating with CHICOP. As part of the activities for the International Year of the Reef in Zanzibar, the BBC-Blue Peter Program filmed such a day excursion of Bububu primary school children to Chumbe on 17 May 1997.

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- **cooperates with the Harbours Authority to keep the lighthouse functioning.** The rangers now act as lighthouse keepers and light the old AGA-gas-powered system (installed in 1926) with matches, when for some reason it is extinguished. Before that, the lighthouse rarely functioned. This service is particularly important for the traditional shipping traffic (dhows) which has no access to modern navigational aids, such as GPS.
- **provides valuable experience in the financially sustainable management of protected areas.** The project is yielding many insights useful for solving the problem of financial sustainability in the management of protected areas in Zanzibar and elsewhere, and the lessons learned will contribute to the development of a sustainable protected areas system in Zanzibar and the Region.

In summary, Chumbe has done work and is offering services more typical of large donor-funded conservation projects, which are not normally contemplated by private business. In addition, due to the substantial bureaucratic delays and other problems, the pre-operational investment from 1992 to date has been four times the original estimate, and more investment is still needed to fully realise the project goals and capitalise on the achievements. This has put the commercial viability at risk, as visitors have to be charged high prices to sustain the park management, or even achieve capital recovery. The present marketing of CHICOP is not yet able to reach the more wealthy markets overseas.

Conclusions

In conclusion, the Chumbe experience suggests that private management of marine protected areas is technically feasible and efficient even when the enforcement machinery of the State is not available or ineffective. The costs of private management are probably considerably lower and the incentives to struggle for commercial survival much stronger than would have been the case with a donor-funded project. Chumbe Island now provides a diverse and undisturbed breeding ground for endangered species in the coral rag forest, and a pristine and diverse coral reef harbouring a very rich fish population.

This confirms findings of the WCMC study mentioned above (Watkins et al. 1996) about the contributions the private sector can make to biodiversity conservation, and is now also recognised by some government departments and donor-funded projects in conservation in Zanzibar. One recent example is the sanctuary established on Chumbe Island, with WWF support, for the endangered endemic Ader's duiker (*Cephalophus adersi*), upon request of the Commission for Natural Resources and the CARE-Jozani-Chwaka Bay Conservation Project.

However, the experiences of the Chumbe Island Project also suggest that the commercial viability of private conservation projects is at risk when cumbersome bureaucratic requirements increase costs for investment in general, and for innovative project designs in particular, and as long as unmanaged or donor-managed wilderness areas can be accessed at very low cost (though still charging high prices) by the tourism industry. What the Chumbe project would need now is additional investment in professional marketing overseas, to access the wealthy markets directly. It is hoped that the selection of CHICOP for presentation at the World Exhibition EXPO 2000 will provide worldwide publicity.

There are other more fundamental issues in Tanzania (and probably some other African countries) which discourage private involvement in conservation. Investment in this field is necessarily long-term and requires high security and a supportive legal and politico-administrative environment. The following conditions would need to be addressed to make the country more attractive for investment in conservation:

- Land tenure in Tanzania and Zanzibar is only available on leasehold, in contrast to other African countries, such as South Africa, Namibia, Botswana and Kenya, which allow freehold and have attracted considerable private investment in protected areas (Watkins et al. 1996).
- While the above situation could be offset to a certain degree by legal provisions creating special incentives for investment in environment and conservation, such as long-term land lease and management rights, reduction of, or exemption from land rents, licences, fees and taxes, these incentives do not exist.

- In Zanzibar particularly, the legal framework does not enhance security of investment in conservation, as private investments under the 1986 Zanzibar Investment Protection Act are affected by a particular weakness of this Act when it comes to the issue of expropriations and compensation.^{iv} Recent additional legislation—the *Environmental Management for Sustainable Development Act 1996*—in actual fact further weakens the provisions of the 1986 Investment Act against the expropriation of private property, as this Act facilitates ‘extinguishing existing rights’ in protected areas for the sake of conservation.
- Though the same Environmental Management Act (1996) provides for management powers to be delegated to private bodies, this may not encourage private commitment to conservation, as proceeds would have to be passed on to the planned government management authority. In actual fact, the Act ignores a situation where the investment in conservation and the establishment of a protected area has been done by a body other than the State.
- Second-tier constraints^v, such as the very cumbersome bureaucratic procedures and wide discretionary powers of civil servants for granting land leases and building permits, as well as residence, work and research permits for expatriate staff, encourage corruption and increase costs of investment. In addition, the customary annual budget speeches announcing sometimes far-reaching changes of legislation affecting these conditions for foreign investment also increase investment costs and add to economic insecurity.
- Some long-term investors in conservation may wish to retire in the country of their project. Present immigration laws in Tanzania do not allow this, and foreigners have to renew their permits every year at considerable cost.
- Another disincentive for private investment is the present labour-market legislation and administration inherited from the socialist past, when the State saw its role in defending workers’ rights against employers. For example, in Zanzibar it is difficult to sack employees because of theft and embezzlement, even when caught red-handed.
- Last but not least, capital recovery from investment in conservation is typically dependent on one single sector of the economy: tourism. The tourism industry is particularly volatile and sensitive to political turmoil (often associated with election periods), adverse weather conditions (el Niño) and perceived security and health risks (cholera epidemics etc.). In 1997 and early 1998, East Africa as a whole had more than its fair share of all of this, with an immediate, and sometimes drastic decline in tourism arrivals.

There is little doubt that the above issues present a very tall order indeed, if the aim is to make Tanzania and Zanzibar more attractive for private investment in general, and private commitment to conservation in particular. It would probably take many years of sometimes painful political decisions and determined action (confronting vested interests) to improve the present legal, institutional and regulatory environment for investment.

Maybe the Chumbe Island Project has been undertaken ten years too early in this part of the world, where on a political level, environmental problems and degradation were not felt severely enough to make conservation a necessity and a priority, and when donor money was still abundant and easily available and the private sector not yet seen as a valued partner in this field. However, it is extremely encouraging to note that those who directly felt the increasing degradation of their environment and had no access to donor money when they joined CHICOP—the fishermen turned park rangers—are now the staunchest conservationists on Chumbe Island and proudly and very competently show visitors around the reef and the forest. Without them, their enthusiasm, commitment and never tiring vigilance, Chumbe Island would not have become the fascinating conservation area it is today, and the project initiator would have been demoralised by the many obstacles and obstructions over the years, and probably stopped the project somewhere halfway.

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- i For more detail see CHICOP, Progress Report 1992-1997.
- ii This chapter is in large parts based on a paper written and presented by Eleanor Carter, Omari Nyange and Yussuf Said, at the National Coral Reef Conference, 2-4 December 1997, Zanzibar.
- iii The then Member of Parliament for Malindi was mentioned, who at that time was also the Minister of Agriculture, Livestock and Natural Resources.
- iv A legal analysis of this Act concludes that 'it seems that the Act was drafted in ignorance or disregard of the controversy at the international level over the issue of compensation for nationalised property. One indication of this is the looseness in the use of certain important terms and the consistent inconsistency... the investor can only appeal against the amount of compensation granted but not against the decision of Government to acquire or nationalize his property' (p.349-350). Chris Maina Peter (1988), The 1986 Investment Protection Act of Zanzibar, ICSID-Foreign Investment Law Journal, p.338-351.
- v In a recent analysis of the investment climate in African countries, Rauth (1997) concludes that, in spite of major policy reforms towards liberalisation of the economy, second-tier constraints remain which 'become overwhelming and pose a critical threat to continued formal private sector development'. As a heritage of socialist or state-driven economic policies in the past, 'most African countries still use control-oriented approaches that have resulted in rule-driven bureaucracies with little service mentality. Institutional practices have been designed with the assumption that the private sector is the antagonist and procedures and regulations are formulated under the assumption that the private sector is guilty until proven innocent. This approach has resulted in particularly cumbersome regulations. In addition, the controls have given government officials wide discretionary powers which have encouraged corruption. Although taxes have been simplified and lowered, they remain numerous, ambiguous and complex. In Tanzania, officials at one prominent business organisation estimate that 80% of all businesses must cheat to survive—and tax liabilities can represent as much as 60% of gross revenue.' Rauth concludes that 'the combination of the ambiguous environment and high taxes created a hothouse for corruption. Business people need to pay bribes to survive and remain competitive. Not surprisingly, civil servants perceive business people as corrupt which leads them to erect more controls and more stringent regulatory processes, resulting in even longer delays. In reaction, businesses resort to bribes to accelerate the process. As a result, a vicious circle of increasing delays (and) corruption is created for formal sector enterprises.'