Posing the question: what and who are we financing?

This paper begins by raising two questions relating to Marine Protected Area (MPA) finance. Firstly, what is the starting point for determining what MPA financing needs are? And secondly, in the light of this, what constitutes the basis for building a diverse and sustainable financial portfolio for MPAs?

Traditional wisdom would suggest that our ultimate goal is to raise adequate and secure funds to cover the operational and management costs of MPAs. In other words, we need to calculate how much is required to pay for the salaries, infrastructure, equipment and maintenance required to run an MPA, and then ensure that money is generated from a multiplicity of sources which will together constitute a broad and mutually-reinforcing base to meet these needs over the long-term.

From an economist’s perspective this is a (very) necessary condition for making MPAs financially sustainable. But, by itself, it may not be sufficient. Building diverse and sustainable finance portfolios requires a much more inclusive approach. Securing cashflows to cover operational costs is often only the tip of the financing iceberg. They may guarantee a well-run MPA, but will not necessarily sustain the MPA in financial and economic terms.

The total economic cost of establishing and conserving an MPA is far greater than operational expenditures, and cost-bearers are not limited to the agency who has the formal mandate to manage it. MPAs simultaneously incur a wide range of additional costs, which constitute real cash losses or economic opportunities foregone for a wide range of groups. These indirect costs are often higher than operational expenditures, and can have an immense influence on MPA status. If MPAs are to be truly sustainable in financial and economic terms, such costs also need to be calculated and covered.

This, in turn, requires a portfolio that is diverse in terms of its financial recipients and mechanisms for benefit generation, as well as its sources. And to calculate these costs, and identify the opportunities for meeting them, requires a sound appreciation of the economic value of the MPA, including both benefits and costs, and beneficiaries and cost-bearers. Unfortunately, because MPAs have long tended to be under-valued in economic terms, much of the potential for raising new sources of funding and for covering these costs has remained unrealised.
This paper considers these questions and issues, with particular reference to the case studies prepared for presentation at the workshop – Bunaken National Marine Park Indonesia (Erdmann et al. 2003), Chumbe Island Coral Park Zanzibar (Riedmiller 2003), and Marine Reserves in Mexico (González-Montagut 2003) – as well as drawing on experiences and examples from other MPAs in various parts of the world.

**A starting point: establishing the total economic value of MPAs**

*The benefits…*

The fact that MPAs generate multiple economic benefits provides an important – although by no means the only, or even the principal – justification for their existence, and for raising funds for their management. Yet for a long time these benefits remained under-valued. Marine ecosystems were primarily seen as being economically valuable only in terms of the physical products and cash income they generated (for example through fisheries, tourism, and other direct uses). This very narrow view of economic benefits often acted to the detriment of MPAs because it undermined their broader acceptability as a worthwhile investment or use of resources. It has also meant that much of the potential to raise finance by capturing some of these wider benefits has remained untapped. Slowly the definition of environmental benefits has however been expanded, and the concept of total economic value now forms the basis of most attempts to define and measure marine benefits. Total economic value goes beyond direct uses and marketed products, and recognises that MPAs also generate a broad range of other, economically valuable, goods, services and functions (Figure 1).

![Figure 1: MPA total economic benefits](image)

A rapidly expanding body of data is now available which underlines the economic importance, and high monetary value, of these broader MPA benefits – and in some cases demonstrates that they far outweigh direct use values. Valuation has underlined that indirect, option and existence benefits are in fact significant in many MPAs. For example it has been calculated that the Great Barrier Reef Marine Park in Australia has domestic option and existence values of more than $36 million a year, as reflected in people’s willingness to pay for its conservation (Spurgeon and Aylward 1992). Coral reefs in Djibouti are estimated to provide carbon sequestration benefits worth almost $0.5 million a year (Emerton 1999), and the natural coast protection function of reefs has been found to average $170,000/km/year (Spurgeon 1998). In Southern Thailand, the economic benefit of mangroves for coastline protection have been calculated to have a value of between $76 (Sathirathai 1998) and $165/ha/year (Christensen 1982), and the storm protection functions of Cambodia’s mangroves are valued at some $32/ha (Bann 1997). Option benefits related to pharmaceutical prospecting from reef species in Montego Bay,
Jamaica, are thought to have a net present social value of more than $70 million (Ruitenbeek and Cartier 2001).

**The costs …**

The understanding of MPA costs remains, if anything, even more limited than that of MPA benefits. Although there is now a growing literature investigating the benefits of MPAs, their costs still do not receive much attention (Sanchirico *et al* 2002). The focus is almost wholly on operational costs – in other words, the direct expenditures associated with running, staffing and equipping an MPA. Again, this constitutes a massive underestimate, as MPAs also give rise to a wide range of indirect and opportunity costs (Figure 2). These can be defined as the benefits or economic opportunities that are diminished or lost by the establishment of an MPA, and include both the value of foregone output from prohibited resource uses and from potential conversion of the area to an alternative use (Dixon *et al* 1993), as well as possible congestion effects on other sites and stocks that remain available for extractive uses and alternative developments (Sanchirico *et al* 2002). Unfortunately, because such costs remain largely unvalued, there has been little effort to consider them as legitimate components of MPA budgets or to raise funds to meet them.

![Figure 2: MPA total economic costs](image)

Although generally lower than for terrestrial protected areas (Post 1994) opportunity costs are an important component of total MPA expenses (Spurgeon 1998), both in comparison to other cost components and in terms of their financial impacts on particular groups and economic activities. For example the indirect costs of Kangaroo Island National Park in Australia are, at some $100,000, almost as high as annual operating expenditures (Dixon and Sherman 1990). The opportunity costs of restricting marine resource use in and around Mafia Island Marine National Park in Tanzania weigh heavily on local fishing communities – dynamite fishing, for instance, can bring a daily income that is more than 6 times the weekly salary of a fisheries officer, and in total unrestricted marine resource utilisation is worth more than $3.3 million a year (Andersson and Ngazi 1995).

**Who reaps the benefits, who bears the costs: what can valuation contribute to MPA financial management?**

Establishing the total economic value of an MPA can thus challenge, and extend, conventional definitions of what constitutes its benefits and costs. But, more than this, it yields important insights and information for planning and implementing strategies for MPA financial management.

**Imbalances in the distribution of benefits and costs …**

Perhaps most importantly, MPA values tend to be distributed unequally – over time, at different levels of scale, and between user groups. Costs are typically incurred on-site, as immediate expenditures or
losses, to the MPA managing agency (for operational costs) and to local residents and resource users (indirect and opportunity costs). In contrast, many of the more valuable MPA benefits are received off-site, or by non-local groups, and may only accrue slowly over time (Sanchirico et al 2002). A mismatch frequently arises whereby local MPA users and managers bear the bulk of financial and economic costs while receiving (or perceiving themselves to receive) few of their benefits, while recipients of MPA values receive these benefits for free or at low cost.

**How this translates into financial and management constraints for MPAs …**

Clearly, these imbalances are inequitable. But they are also reflected in a number of important financial and management constraints. They mean that many of the benefits, and potential funding sources, of MPAs remain uncaptured. Even though they may hold extremely high and tangible economic values, the generation of marine goods and services and people’s demand for them are not captured as financial returns to the MPA. At the same time local managers and users, whose actions have the most potential to influence the status of MPAs, are often left in a position where they are financially and economically unwilling, or unable, to bear the costs that are incurred to them.

This can obviously translate into very real problems for MPA-managing authorities – as demonstrated by the case of Bunaken National Marine Park, where the legal stipulation that all entrance fees were to be channeled to the national treasury provided few incentives for park authorities to raise more funds (Erdmann et al ibid.). Where resource users and local communities suffer an undue or uncompensated burden of opportunity costs, serious management problems also tend to arise. In Kisite-Mpunguti Marine National Park in Kenya, for example, the opportunity costs of marine conservation through exclusion from the park and its resources were some 10 times higher than direct management expenditures, and several times as high as local benefits received (Emerton and Tessema 2001). As a result, adjacent fishing villages incurred a net loss from the MPA and proved unwilling to abide by park regulations and resource use restrictions.

Failing to correct these financial and economic imbalances often sends confusing signals to managers and users about the economic viability and value of an MPA, and fosters perverse incentives or disincentives against marine resource conservation. All too often, it remains more profitable for individuals to transgress MPA regulations, regardless of the long-term or broader social and economic costs of doing so (Salm et al 2000). For example work carried out in Indonesia has shown that activities such as poison and blast fishing, unsustainable catches and coral mining can bring huge private profits to individuals, with net values of between $15,000 and $121,000 per km², despite the far larger long-term costs in terms of diminution of the fishery itself (Cesar 1996). Similarly, in the case of Chumbe Island Coral Park, high prices make fishing an attractive occupation, even though there are regulations in place which prohibit fishing and anchorage (Riedmiller ibid.).

**Using valuation for financial planning …**

However great, or diverse, its financial portfolio becomes, it remains difficult to consider an MPA to be sustainable as long as this type of financially and economically imbalanced situation persists. Here, valuation of the total economic costs and benefits of MPAs becomes a critical tool for financial planning and management. Valuation cannot by itself solve these problems and imbalances, but it can highlight where and for whom they occur, and help to identify where there are needs and niches for raising and allocating funding. Although to date there have been few applications of valuation tools to determine needs and mechanisms for covering MPA costs, they have played a key role in the ability of MPAs to capture more diverse and sustainable funding sources.

In particular, valuation is increasingly being used to set user fees for MPA goods and services, to ensure that prices are based on actual benefits provided, to predict what impacts charges will have on demand, and to gauge their potential to raise revenues for conservation. Conducting willingness-to-pay surveys helped determine park entrance fees for Bunaken National Marine Park (Erdmann et al ibid.), and overnight fees for Chumbe Island Coral Park (Riedmiller ibid.). Hon Mun Marine Protected Area in Vietnam (Nam and Son 2001), Phi Phi Islands Marine Park in Thailand ( Seenprachawong 2001), and Moalboal-Cebu, Siquijor and Pamilacan Island-Bohol MPAs in the Philippines (Rosalles 2003) also provide examples of the use of valuation to determine MPA benefits and beneficiaries, and to set user fees to diversify financial portfolios.
Using economic valuation to enhance the sustainability and diversity of MPA finance portfolios: how do we move forward?

Where financial sources have become more innovative …

Over recent years, major moves forward have been made in building diverse and sustainable finance portfolios for MPAs. All three of the cases presented at this workshop illustrate such innovations, and show how a diversity of funding sources can simultaneously be deployed to fund MPAs. Financial resources that go beyond traditional government subventions and donor funds range from user charges such as the entrance fees for Mexico’s MPAs (González-Montagut ibid.) to voluntary “preservation” payments in Bunaken National Marine Park (Erdmann et al ibid.). Private sector sources, too, are providing an increasingly important component of MPA funding, whether from donations as in Mexico (González-Montagut ibid.) or through investment in a profit-making MPA enterprise such as Chumbe (Riedmiller ibid.).

The mechanisms for holding and managing MPA funds have become more sustainable and diverse, and alternatives to state budgeting procedures are being tested. An endowment fund is being proposed for Bunaken (Erdmann ibid.), and a private fund has already been established for MPAs in Mexico (González-Montagut ibid.). The allocation of funds raised is also becoming much more targeted – for example user fees are now retained at the MPA-level in Bunaken and a proportion of MPA revenues are allocated both to local government and to village-level conservation and development activities (Erdmann et al ibid.), and profits raised by Chumbe are ploughed back into investment in the MPA (Riedmiller ibid.).

The need to diversify financial recipients and payments …

But, to date, there has been far less progress achieved in determining what MPA financing needs are, or in deploying the new financial resources that are starting to be raised to cover the total economic costs of MPAs. There is a growing recognition that financial portfolios need to address additional costs and cost-bearers. For example, the costs of managing Bunaken National Marine Park also include outreach and neighbouring community development projects, and a portion of the MPA budget is allocated to these activities (Erdmann et al ibid.). Likewise the management of Chumbe Island Coral Park is based on a recognition that MPA management can be more successful, and profitable, if project design focuses more on direct resources users and stakeholders who have long-term economic incentives to support sustainable management (Riedmiller ibid.). These financial and economic incentive systems however often need to be introduced as part of the MPA financial portfolio, or at least enhanced through it. And the way in which an MPA is valued and funded can provide an important means of ensuring that this happens.

Not all MPA costs are expressed through the market, and not all of the benefits that are mobilised to cover them need to be strictly cash in nature. For example, around Chumbe, broader economic benefits generated include natural restocking of adjacent reef areas, preference to local people for employment, and the provision of rescue services for fishers (Riedmiller ibid.). But if they are to truly offset the economic costs of MPAs, and balance economic disincentives to marine conservation, such benefits need to be based on a sound appreciation of the economic nature and value of the losses being incurred, and to be reflected in the appropriate allocation of funds to the relevant groups. Many of the indirect costs of MPAs do however accrue as real cash losses and expenses – for example income foregone or additional expenditures or purchases necessitated. And here there is a need to ensure that comparable cash transfers or returns are generated as part of the MPA’s financial portfolio. All too often it is assumed that some token level of spending on general community development activities will adequately offset the financial and economic opportunity costs incurred by an MPA. In reality, it is unlikely that this will have much impact on the economic and financial forces that threaten the MPA in the first place.

Achieving real financial diversity and sustainability …

For too long there has been a tendency to ignore such MPA cost bearers and financing needs. Still, we
rarely see this broader definition of costs and cost-bearers being operationalised in on-the-ground MPA management, or reflected in MPA finance portfolios. And yet, only when MPA financial portfolios become more diverse in terms of their payments and beneficiaries, as well as their sources, might we start to move towards a situation where they become truly sustainable in financial and economic terms.

**References**


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