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The role of ecotourism and sustainable tourism in ensuring environmental sustainability in the marine environment

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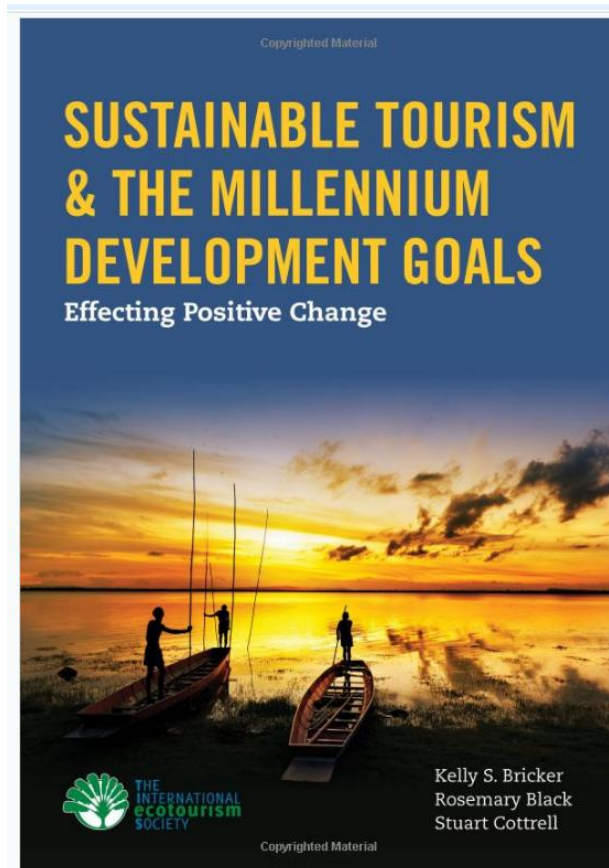
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Chapter 9- The role of ecotourism and sustainable tourism in ensuring environmental sustainability in the marine environment.

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Learning outcomes

This chapter will:

Show the links between environmental sustainability and other MDGs in the marine environment

Identify some of the specific challenges faced in protection of marine areas, and their management through looking at the Great Barrier Reef World Heritage Area.

Consider the usefulness of the Sustainable Livelihoods Approach in understanding community assets towards fulfillment of the MDGs

This chapter will discuss the role of ecotourism and sustainable tourism in supporting and meeting the Millennium Development Goal (MDG) of ensuring environmental sustainability, with a focus on the marine environment. Sustainable environmental development in the marine environment is highly dependent on the achievement of other MDGs due to high interdependencies. The interlinked nature of the marine environment means that all activities in this environment are likely to influence one another. Consequently there are a number of specific threats to environmental sustainability, of which tourism development is only one. Indeed, the two principal MDG targets of ensuring environmental sustainability most relevant to the marine realm are also closely linked. These are to ‘integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources’ (7a) and to ‘reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss’ (7b) UN 2008:36. It would seem that the second aim is one of halting the tide of environmental destruction, whilst the former aims use sustainability to reverse this decline. A useful framework for supporting the complexities of environmental sustainability is discussed in the Sustainable Livelihoods Approach, and its evaluation of community assets, with natural capital at its core. The latter part of this chapter examines specific strategies to mitigate and even remove these threats, using the Great Barrier Reef as an example, in many cases using sustainable tourism as a galvanizing force for positive outcomes.

Environmental sustainability and biodiversity.

It is widely acknowledged that the seas are a repository for global biodiversity, and yet paradoxically they are the least well documented. Out of 33 animal phyla, 32

are found in the sea, 15 of which are exclusively marine, and oceans contain the world's largest (the blue whale) and smallest (meiofauna) animals. However, compared with 1.5 million land species, only 275,000 marine species have been identified and described, and yet it is estimated that coral reefs alone may harbour in excess of 1 million, with as many as 10 million in the deep ocean basins (IUCN/WWF, 1998). It is no wonder that it has been claimed that, in the light of the fact that 'only around one-tenth of the 290 million km² of the seabed has actually been explored and charted', 'we know more about the moon than our own ocean world' (IUCN/WWF, 1998, p. 10). This lack of knowledge also reminds us of the vast potential of the marine environment for ecotourism activity.

Despite this lacuna of knowledge, it is clear that oceans are indispensable to our life support, livelihoods and lifestyles. The oceans are 'the engines that drive the world's climate, defining weather and storing huge quantities of solar energy in the process ... the liquid heart of the Earth's hydrological cycle – nature's great solar-driven water pump' and ocean currents – 'the blue planet's super highways, transfer great quantities of water and nutrients from one place to another. The Gulf Stream, for instance, pushes more water than is carried by all the rivers on Earth from the Gulf of Mexico and the Caribbean across the Atlantic into northern Europe' (IUCN/WWF (1998) p. 7). Economically oceans contribute 63% (US\$20.9 trillion) of the goods and services provided by the world's ecosystems, over half of which (US\$12.6 trillion) originate from coastal ecosystems (IUCN/WWF, 1998). Scottish waters generate £14 billion, or 21%, of Scottish GDP each year (SWT/WWF, 2005). Oceans and coasts provide a myriad of products ranging from food to minerals, drugs and medicines, but also enhance our lifestyles in terms of opportunities for rest and recreation. As the former becomes increasingly corporatized and hidden, our divorce from this

connection to nature spurs a need to reconnect through tourism and leisure activity. Millions of tourists are attracted to the sea every year by the proliferation of opportunities such as swimming, snorkelling, diving, water sports, boating, sailing, fishing and wildlife viewing. Whilst efforts are underway to exploit space as the 'final frontier' for tourism, it is clear that the penultimate frontier still offers much untapped potential.

Consequently tourism and recreation has an increasingly marine focus. Indeed, Hall (2001) describes how the ocean and marine environment is not only a 'new frontier' but also one of the fastest growing tourism market segments, citing the US National Oceanic and Atmospheric Administration's recognition of the fact that it is increasing, both in terms of volume and diversity, more than any other coastal activity. Partly this is as a result of geographic trends, for an increasing proportion of the world's population resides in coastal regions. For example, although coastal states make up only 11% of the contiguous USA in land area, they are home to over 50% of the population (Cordell, 2004). In Australia the situation is even more pronounced, as over three-quarters of the population live within 40 km of the coast, and one-quarter are within 3 km. It is no surprise then, that recreational activities are likely to make heavy use of the marine environment.

At the same time MDG reporting suggests that the marine environment is under significant threat. For example, the proportion of overexploited and depleted stocks in fisheries has increased over the past 20 years (UN, 2008). Total catches have been maintained at roughly the same level through the use of new resources, but this may become increasingly difficult, as this is largely due to technological advances in what has been dubbed by some commentators 'a war on fish' (The End of the Line, 2009). Major efforts are now required to improve fisheries management and to

improve the productive capacity of exploited stocks. Management action is also required to mitigate the impact of fisheries on aquatic ecosystems. These concerns can be addressed through the adoption of a holistic, participatory ecosystem approach to fisheries management. A number of initiatives have taken hold in this direction, such as reducing total allowable catches of commercial species, reducing bycatch of vulnerable species (for example, seabirds and sea turtles), and establishing marine protected areas. However, reducing fishing capacity remains a key objective of global fisheries management (UN, 2008).

As described in the previous chapter, climate change also has a major impact on the marine environment. Sea level change will clearly have the greatest impact in littoral zones where relationships with the marine environment are so important. Indeed, while no area can escape the adverse impact of climate change, ‘the Arctic, small islands, mega deltas in Asia and Africa, and the African region overall seem to be especially vulnerable because of their high exposure to the effects of climate change, their populations’ limited capacity to adapt to the consequences, or both’ (UN, 2008:37). Warming of the oceans themselves is causing changes to ecosystems on a vast scale, for example the increased incidence of coral bleaching described below. Furthermore climate change models point to the disruption of the all important ocean currents. However, solutions to this threat may be far from easy. For example, despite the MDGs call for ‘transition to cleaner and renewable energy sources’ and the requirement for ‘large investments in energy projects over the coming years’ (UN 2008:37), there is considerable concern about the local impacts of some of these schemes in marine settings. Many of the huge tidal, wave and offshore wind energy schemes currently being planned and constructed around the world may have unintended environmental impacts in this realm.

Protecting biodiversity

It is clear therefore that biodiversity is central to environmental sustainability, and indeed many of the other MDGs. Furthermore as biodiversity is the flagship for marine ecotourism (for example the scuba diving destinations of the ‘coral triangle’), it is fundamental to livelihood opportunities. Indeed, ‘loss of biodiversity will also hamper efforts to meet other MDGs, especially those related to poverty, hunger and health, by increasing the vulnerability of the poor and reducing their options for development’ (UN, 2010:55). One of the most widespread methods for protecting marine biodiversity has been through the creation of Marine Protected Areas (MPAs). Much like their terrestrial counterparts (described in more detail in the next chapter) these have become important venues for ecotourism, although this is often spatially concentrated (see below). Although the number of marine protected areas has grown rapidly in recent years, their performance remains highly variable. Kelleher *et al.* (1995) assessed the management level of 383 out of the 1306 MPAs they inventorized across the globe. They concluded that 31% could be classified as having a high management level (generally achieving their management objectives), 40% as moderate and 29% at a low level. The reasons for MPAs failing to achieve their management effectiveness are many and various, but recurrent factors were: (i) insufficient financial and technical resources; (ii) lack of data; (iii) lack of public support and unwillingness of users to follow management rules; (iv) inadequate commitment to enforce management; (v) unsustainable use of resources occurring within MPAs; (vi) impacts of activities in land and sea areas outside the boundaries of MPAs; and (vii) lack of clear organizational responsibilities for management and lack of coordination between agencies with responsibilities relevant to MPAs (Kelleher *et*

al., 1995, p. 17). Burke and Maidens (2004) analysed the effectiveness of MPAs in the Caribbean using expert assessment. They generated a simple measure of management effectiveness using only four broad criteria: (i) existence of management activity; (ii) existence of a management plan; (iii) availability of resources; and (iv) extent of enforcement. Of the 285 parks examined in this way, only 6% were rated as effectively managed, 13% partially effectively managed and nearly 50% judged to have an inadequate level of management.

These authors suggested two major reasons for such a high level of failure. The first is that of lack of long-term financial support. Kelleher *et al.* (1995) suggested that a critical issue in financing marine protected areas was the assessment and publication of the economic benefits of MPAs, which often exceed those of any alternative use. They suggested that wider regional benefits, particularly in tourism, are ignored despite the fact that these extend beyond direct financial flows from entry fees to include improved overall fish catches; there is also revenue from the external tourism industry and employment in these industries. The identification and establishment of facilities to promote ecotourism in MPAs by management agencies in cooperation with local communities and other groups is advocated. The second major reason for failure of MPAs, as suggested by Burke and Maidens (2004), is the critical issue of a lack of support from the local community. This is usually attributable to a lack of local involvement in planning and a failure to share financial or other benefits. It is this human dimension that has been increasingly recognized as being paramount in determining the success or failure of MPAs. Mascia (2003) suggests that, rather than biological or physical variables, social factors are the primary determinants. The local acceptance of regulatory measures is a crucial factor in the establishment of an effective MPA. In general, the ownership of responsibility

and compliance to rules increases as more and more users of resources are directly included in the management decisions and the responsibility becomes local. The most important predictors of success determined by a study of 45 community-based marine protected areas in the Philippines by Pollnac et al. (2001) included: (i) population size of the community; (ii) a perceived crisis in terms of reduced fish populations; (iii) successful alternative income projects; (iv) high levels of participation in community decision making; and (v) continuing advice from the implementing organization along with inputs from local government. In Kimbe Bay, West New Britain province, Papua New Guinea, the Mahonia Na Dari (Guardians of the Sea) conservation and research centre has implemented a network of Locally Managed Marine Areas (LMMAs) that are managed by the community for the community (figure 9.1). This has been an effective grassroots approach that has contrasted with the failure of previous efforts, which failed to maintain local solutions and control.



Figure 9.1 Locally Managed Marine Areas (LMMAs) in Kimbe Bay, West New Britain province, Papua New Guinea.

However, it is not as easy as declaring that one management type is better than another. Mascia (2001) suggests that both locally and privately administered MPAs are particularly vulnerable to changes in leadership that diminish their ability or willingness to manage sites. Collaborative management systems are therefore advocated as a means of overcoming many of the weaknesses of community-based and centrally managed MPAs, as they can merge national capacity with local interest

and knowledge. Such collaboration, however, must extend beyond vertical integration to embrace cross-sectoral interests. Kelleher *et al.* (1995, p. 19) call for the integrated management of all uses of sea and land areas adjacent to MPAs, identifying land-based activities such as forest clearance, agriculture and urban development as particular threats to marine biodiversity through marine pollution. As they argue, MPAs cannot tackle such issues in isolation and therefore must be linked in with wider coastal zone management programmes. The need for a holistic, integrative approach to biodiversity protection has been recognized for some time, but Integrated Coastal Zone Management (ICZM) as a tool for achieving sustainable levels of economic and social activity in coastal areas, while protecting the coastal environment, has recently been the focus of an unprecedented level of interest from multilateral agencies as well as from inter-governmental and individual governments, and links to the goal of integrating sustainability.

Integrating sustainability

The second MDG target of most relevance to the marine realm is that of integrating sustainable principles into policies and programs and to bolster environmental quality. However, the marine environment offers significant challenges for the integrating sustainability goals. In particular, the open nature of the marine environment brings with it considerable problems of management. Marine systems differ from terrestrial systems in terms of a much higher degree of connectivity attributable to 'the sea's large size, enormous volume, continuity of habitats and ubiquitous currents' (Lourie and Vincent, 2004, p. 1005). The high degree of connectivity in the seas facilitates the transmission of substances and effects (Kelleher, 1999). Sea currents carry sediments, nutrients, pollutants and organisms

through, and beyond, a specific location. Consequently, actions taken in one locality, by whatever form of activity, tourism or otherwise, marine or terrestrial, may affect another hundreds of miles distant and often nations apart. The issue of connectivity is not confined to the seas and oceans themselves, but is as vital a consideration at both the air/sea and the land/sea interfaces. Air pollution and run-off and point discharges from the land and rivers are estimated to account for around three-quarters of the pollutants entering marine ecosystems (World Resources Institute, 1996). The White Water to Blue Water Partnership (WW2BW), launched at the World Summit on Sustainable Development in 2002, recognizes the significance of land-based sources of marine pollution such as sewage, industrial pollution and agricultural run-off and aims to promote integrated watershed and marine ecosystem-based management.

In development terms it is interesting to note that traditional societies often recognize the inextricability of the land and sea. The indigenous people of South Pacific islands regard 'the land, its adjacent reefs and lagoons, and the resources therein, together with the people [as] ... a single integrated unity' (Sofield, 1996). Traditional clan territories in the Torres Strait Islands, Australia, by custom if not by law, comprise both land and sea territories that include adjacent home reefs as well as extended sea tenure over the waters, submerged reefs and sandbanks beyond (Zann, 2005). The residents of Mafia island, Tanzania, view the 'ownership' and use of both land and sea in related terms and fail to make an artificial distinction between the two, regarding terrestrial and marine activities as complementary. Walley (2004, pp. 153–156) describes how residents sometimes describe the work that they do on both land and sea as 'farming', as well as their view that the communal 'proprietorship' of *wenjeyi* over the land extends to the sea.

This notion of communal proprietorship brings us on to consider the whole question of ownership and access to marine resources. Whereas the seas and oceans have frequently been described as common property, and consequently subject to Hardin's 'tragedy of the commons', it is more accurate to describe them as a common-pool resource. A common property resource is one where the members of a clearly defined group have the legal right to exclude non-members from using that resource and, thus, it has been argued, there may be important social institutions that can effectively manage the commons. In the permeable situation of marine resources, this exclusion is much more complex, leading to a common-pool scenario. Interestingly, Young (1999, p. 586) describes how 'many of the same problems of managing common-pool resources encountered in fishing are now emerging in ecotourism'. We can see therefore, in these instances, and especially on the high seas, how marine resources can effectively be viewed as open access and that it is the 'tragedy of open access' (Lynch, 1999) that we are concerned with: there being a positive incentive for individual users to exploit the resource to the maximum, even if destruction of marine resources is the inevitable result.

Sustainable marine livelihoods

The Sustainable Livelihoods Approach (SLA) offers a useful integrative framework for examining the impacts of tourism, both positive and negative, on people's assets (Ashley, 2000). Although the SLA was developed during the 1990s as a new approach to poverty reduction (Carney, 1999) – indeed, it has been central to the focus on the emphasis on 'pro-poor tourism' in recent years (Ashley *et al.*, 2001), it will be seen that it facilitates a systematic appraisal of the various ways in which tourism in general, and marine ecotourism in particular, impacts on coastal

livelihoods. The approach is people-centred, designed to be participatory and has an emphasis on sustainability. Also, as Cahn (2002, p. 3) suggests, it 'is positive in that it first identifies what people have rather than focusing on what people do not have. The SL approach recognizes diverse livelihood strategies, it can be multi-level, household, community, regional or national, and can be dynamic'.

At the heart of the SLA lies an analysis of five types of asset upon which people draw to build their livelihoods (Sustaining Livelihoods in Southern Africa, 2002). These are: (i) natural capital (the natural resources stocks upon which people draw for livelihoods); (ii) human capital (the skills, knowledge, ability to labour and good health important to be able to pursue different livelihood strategies); (iii) physical capital (the basic enabling infrastructure such as transport, shelter, water, energy and communications); (iv) financial capital (the financial resources available to people such as savings, credit, remittances or pensions, which provide them with different livelihood options); and (v) social capital (the social resources such as networks, membership of groups, relationships of trust upon which people draw in pursuit of their livelihoods). It has been suggested, however, that to this classic pentagon should be added cultural capital, which can be defined as the cultural resources (heritage, customs, traditions) that are very much a feature of local livelihoods (Glavovic *et al.*, 2002; Sustaining Livelihoods in Southern Africa, 2002). The case study later in this section highlights the importance of underwater archaeological heritage in the Caicos in the Caribbean for example.

Notably there is considerable overlap between the MDGs and the SLA. For example *achieving universal primary education* is a cornerstone of human capital. Of relevance to this chapter, the goal of *ensuring environmental sustainability* contributes directly towards both natural and physical (especially water) assets. The

SLA is also important if represented diagrammatically whereby natural capital can be seen as the top of a pyramid of livelihood assets (figure 9.2). In this sense ensuring environmental sustainability both rests on, and is crucial to the foundations of all of the other community assets. This building blocks approach is particularly relevant to the marine environment where all stakeholders, including tourism, are so interdependent.



Figure 2: The building blocks of the Sustainable Livelihoods Approach with corresponding MDGs

Case study: Marine tourism's contribution to environmental sustainability on the Great Barrier Reef.

Tourism on the Great Barrier Reef

As the largest biological feature on earth, the Great Barrier Reef is arguably the world's most famous marine tourism attraction, stretching more than 2,300km along the northeast coast of Australia from the northern tip of Queensland to just north of Bundaberg. Aside from the coral reefs, the region also contains a wide variety of other habitats, and an extraordinary diversity of plant and animal species. Its popularity as a destination has been somewhat in parallel to increased political and scientific interest in the marine environment felt since the 1950s. Technological advances that enabled access to this environment, particularly the invention of the aqualung, had no small part to play in significant increases in visitors right through the 70s and 80s. At this time forecasts were being made of continued growth for the foreseeable future, and thus a concern with the potential impacts of these tourists led to the founding of the Great Barrier Reef Marine Park Authority (GBRMPA) in 1975 and world heritage listing in 1981. The rapid increase in numbers of tourists and development of tourism infrastructure development on the reef, which caused great concern in the 1980s, has stabilised since 1995, but its global reputation and the emergence of new inbound markets may bring increased pressure.

As befits a destination such as the Great Barrier Reef, the scope and range of tourism activity within its boundaries is truly diverse. Figures suggest that tourism is far and away the largest commercial activity in the Great Barrier Reef region, generating over A\$4.228 billion per annum (BTR, 2003). As a consequence, the marine tourism industry is a major contributor to the local and Australian economy. In 2010 there were approximately 840 permitted tourism operators and 1700 vessels and

aircraft permitted to operate in the Park (GBRMPA, 2011). Tourism attracts approximately 1.9 million tourist visitors each year (GBRMPA, 2011). Recreational use of the GBR region by coastal residents is also high, with almost 5 million visits per year, and in many circumstances, the impacts of recreational users can be impossible to separate from those of commercial tourism activities (Harriot, 2002). Some of the principal tourist activities that take place within the marine park include boat trips, snorkelling, scuba diving, fishing, whale watching, island resorts and cruise ships. However, it is important to note that this tourism activity is highly concentrated. Some 85% of all visits take place within the Cairns and Whitsunday sections of the park, which represent less than 7% of the total area (CRC Reef, 2003).

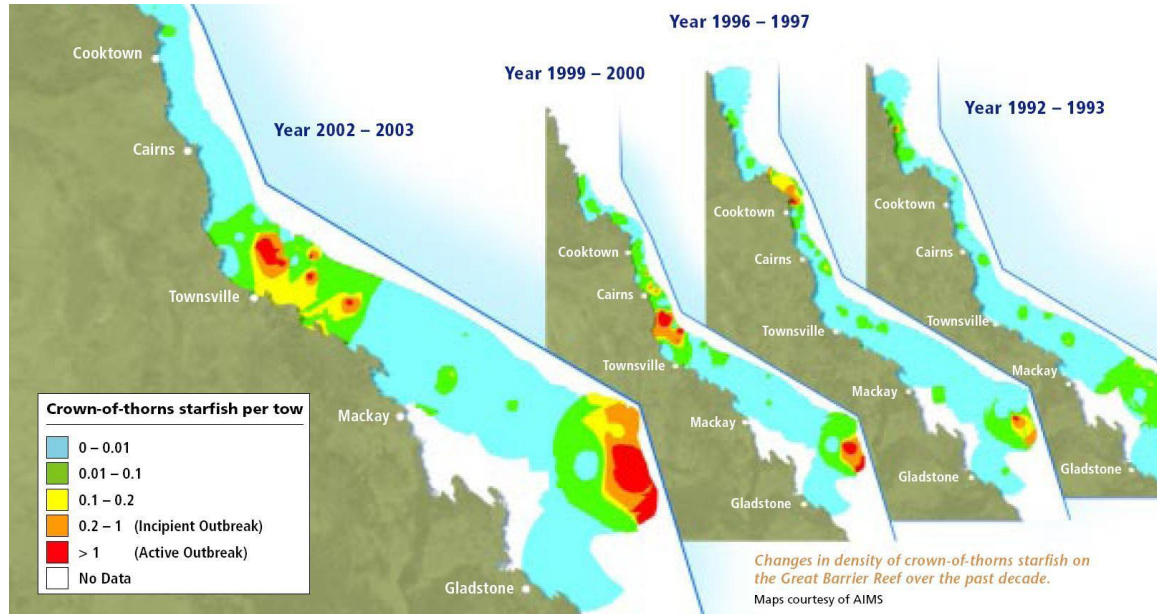
Environmental Threats

The two principal environmental threats to the Great Barrier Reef are those of Crown of Thorns starfish and coral bleaching. Both are clearly a threat to the Reef as a tourist resource, as they have the potential to destroy the very thing that tourists come to see. Indeed, much travel media reporting has taken a 'see it whilst you can' tone in recent years. The diversity and beauty of the corals themselves, and their central role in reef ecosystems, makes them the keystone species in the tourist-marine interface. The threat that these pose is taken very seriously. Overfishing is less of an issue in the Great Barrier reef than other coral reefs, as a result of an effective and adaptive protection strategy described below. However, marine tourists play an important part in the justification for, and sometimes implementation of, many of these environmental protection strategies.

Crown of Thorns starfish are a threat to the reef because once the starfish reach maturity, at about six months, their primary diet is live coral, and they may live

up to seven years. During a severe outbreak, there can be several crown-of-thorns starfish per square metre and they can kill most of the living coral in an area of reef, reducing coral cover from the usual 25 - 40% of the reef surface to less than 1%. Such a reef can take 10 years or more to recover its coral cover (CRC Reef, 2001). Outbreaks of the starfish have been observed with some regularity since the advent of SCUBA equipment, and underwater observation has been made possible. An outbreak in 1962 on Green island swept throughout the reef during the next decade, as the larvae from this colony were carried by ocean currents to the southern areas. This southward progression of outbreaks has been a consistent pattern in subsequent events in the central Great Barrier Reef. A much larger outbreak occurred in 1979, and an estimated 17% of the total reef area was affected by this over the next few years. Further outbreaks occurred in the years following 1994, and by 2000, the greatest concentrations were to be found in the region between Cairns and Townsville (figure 13). Controlling the starfish is extremely difficult, given the size and variability of the underwater environment. While the GBRMPA does not support the widespread eradication of the crown-of-thorns starfish, the GBRMPA grants permits for localised, small scale crown-of-thorns starfish control programs at key tourism or research sites (Hoey and Chin, 2004). A selective method of control is to inject individual starfish with a poison that kills them within a few days. Earlier research suggests that some tourism operators in the Cairns region were spending up to \$300,000 each per year in Crown of Thorns starfish control (CRC Reef, 2001). The federal Government committed a total of \$2.4 million to starfish control from 2002 to 2007 for distribution to operators through the Association of Marine Park Tourism Operators. By December 2003, divers involved in the program had removed some 48,000 starfish across 51 reefs and had helped to significantly reduce starfish numbers at key sites. It

has recently been suggested, from work conducted in Fiji (Diver, 2004), that more comprehensive controls on fishing and a strong network of sanctuary zones could reduce the number of starfish outbreaks.



Rising sea temperatures brought about as a result of global climate change, may also have a significant impact on the Great Barrier Reef. Coral polyps are extremely sensitive to even minor changes in sea temperature. It is estimated that corals on the Great Barrier Reef will experience between 2 degrees Celsius and 6 degrees Celsius increases in sea temperature by 2100. Such a rise causes the coral polyps to eject the algae that give the coral structures their colour, leading to so-called ‘bleaching’. The coral polyps can continue to survive for a period without the algae, but unless they return, and their nutrient provision is regained, the polyps and hence the coral colony itself will die. Significant warming, and hence major bleaching events occurred in the Great Barrier reef in 1998, and four years later, in 2002. In the more recent event, of all the reefs surveyed across the whole Marine Park, 60-95% were bleached to some extent. Around 5% of reefs have been severely damaged – and

between 50-90% of corals on these reefs were dead (WWF, 2003a). In relation to the Great Barrier Reef specifically, the Intergovernmental Panel on Climate Change stated that the Great Barrier Reef faces significant death or damage from coral bleaching of medium to high certainty over the next 20-50 years (WWF, 2003b). In addition, the increase in storms and wave action as a result of climate change, also pose a threat to the future stability of the reef (WWF, 2001). There is very little that can be done to control coral bleaching at a local level. Some recent work suggests that corals may be able to partially adapt to sea temperature change through altering their relationship to the algae (Buddemeier and Fautin, 1993). However, this evidence comes from areas used to greater variability in sea temperatures, and should not be relied upon as a strategy that may be employed by the Great Barrier Reef coral communities. Nevertheless, tourism operators provide an important early warning system for coral bleaching episodes as detailed below.

Managing Tourism to the Great Barrier Reef

Managing tourism activity and ensuring environmental sustainability in this huge area (the park is bigger than the area of the UK, Switzerland and Holland combined) is far from simple. Under the world heritage listing the Australian government is responsible for ensuring a delicate balance between reasonable human use and the maintenance of the area's natural and cultural integrity. As a UNESCO report in 2002 states; “the enormity of this task is compounded by the sheer size of the GBRWHA, its economic importance, the political and the jurisdictional complexities determined by Australia's system of Federalism, the close proximity of rural and urban populations to the coast, the range of users and interest groups whose use patterns frequently compete and displace each other, the need for equity and fairness

in access to resources, and the ecological diversity of the region”(10). Management has been primarily achieved using a spectrum of multiple use zones ranging from General Use Zones where most reasonable activities can occur, through to National Park Zones (no-take zones which provide opportunities to see and enjoy the diversity of the Reef but where no fishing or collecting are allowed), to Preservation Zones (reference areas which are off limits to virtually everyone except for limited scientific research).

In 2003-2004 The Great Barrier Reef Marine Park was rezoned as a result of implementing the Representative Areas Program. This was instigated by a recognition that the previous zoning of no-take or green zones, which made up less than 5 % of the park, did not adequately protect the entire range of plants and animals and should be revised. In addition there were a number of inconsistencies between the management of state waters, extending to 3nm offshore, and the federal zone beyond. As a result a selection of 70 bioregions was identified, being ‘representative’ examples of all of the different habitats and communities in the GBRWHA. Each bioregion contains plant and animal communities, together with physical features, that are significantly different from the surrounding areas and the rest of the GBRWHA (GBRMPA, 2003). A high degree of public consultation was encouraged throughout the planning process. These representative areas join the existing network of green zones in forming a greater area that restricts extractive activity. Approximately a third of the total area of the park is now afforded this higher level of protection. Many non-consumptive tourism activities, such as swimming and snorkelling are still permitted within these zones.

The Great Barrier Reef Marine Park Authority takes the lead role in DDM (Day to Day Management) of the region in conjunction with Queensland Parks and

Wildlife Service. This activity is funded by both the Commonwealth and State governments who provide matching funds primarily for enforcement, surveillance, monitoring and education/interpretation. In order to provide additional funds for these activities, an Environmental Management Charge (EMC) was introduced in mid 1993, payable by all visitors to the reef on commercial operations. At present the charge for individual visitors is AU\$5.50. EMC logbooks and charging returns are provided by the GBRMPA to all commercial operators at the beginning of each calendar year or when a new permit is granted. Operators are required to keep a logbook of operations and supply charging returns on a quarterly basis. Penalties exist for commercial operators who do not maintain records or pay the required EMC. EMC data from the logbooks is used for the purposes of charging, but also provides valuable data to the GBRMPA relating to tourism use of the Marine Park.

From sticks to carrots

GBRMPA is advised on management issues about the Marine Park at a local level by voluntary community-based committees called Local Marine Advisory Committees (LMACs). The committees were established in 1999 to enable local communities to have effective input into the management of the Great Barrier Reef Marine Park (Marine Park). They provide a community forum for representative interest groups, government representatives such as the Queensland Parks and Wildlife and Queensland Department of Primary Industries and Fisheries and the local community, to come together to discuss issues about marine resources and their concerns. This helps the GBRMPA and other management agencies to keep in touch with marine and coastal issues at a local level and understand the use of the Marine

Park. LMACs provide both an advisory and a communication role between the community and the GBRMPA.

GBRMPA has also moved from a regulatory to a collaborative approach with tourism operators working in this environment. Recognising that tourism operators are the ones who have perhaps the greatest stake in ensuring the long term sustainability of the tourist resource (the reef itself) a number of initiatives have been put in place through the Tourism and Recreation Reef Advisory Committee (TRRAC). The *Eye on the Reef* is a partnership between the tourism industry, the GBRMPA and the reef research community making use of the fact that tourism operators are the most regular visitors to the reef. Being in an ideal position to observe changes to the reef, selected tourism operators collect a range of biological information at frequently visited reef and island sites. The data is then stored in a database available to reef managers and reef researchers and site reports are prepared for tourism operators and crew. Moving towards a more interactive approach that suits the contemporary business environment and high staff turnover, GBRMPA now has an online tourism operators handbook called *Onboard* which covers all aspects of operating in the Marine Park. The website helps operators to keep up-to-date about changing management arrangements for the Marine Park, and also provides interpretive and educational resources.

Perhaps the most significant push towards collaborating for environmental sustainability has come through the *High Standard Tourism Program* (HSTP) which rewards operators with longer permit terms for achieving ecocertification. This initiative encourages best practices tourism operations and offers benefits to operators who are certified to a high standard. Currently GBRMPA recognises the comprehensive ECO Certification Program operated by Ecotourism Australia, at the

Ecotourism and Advanced Ecotourism levels of certification. Initially the GBRMPA is offering high standard operators achieving Advanced Ecotourism certification an extended permit term of 15 years. Certified operators are also showcased on the GBRMPA website and at trade events such as the Australian Tourism Exchange.

Policy Context

The policy context in which the Great Barrier Reef exists is almost as diverse as the reef itself. In addition to the World Heritage Convention, a number of other international conventions discussed in this chapter, apply to the GBRWHA or parts of it. For example the 1971 Ramsar Convention; the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES 1973); the Convention on Conservation of Migratory Species of Wild Animals (Bonn Convention 1979); the Convention on the Law of the Sea (UNCLOS 1982); the International Convention for the prevention of pollution at sea (MARPOL); and the Convention on Biological Diversity (CBD 1992) (UNESCO, 2002).

At a national level the most important legislation is of course the Great Barrier Reef Marine Park Act, which was enacted in 1975 "to provide for the protection, wise use, understanding and enjoyment of the Great Barrier Reef in perpetuity..."; in other words, to protect the area's outstanding biodiversity whilst providing for reasonable use. However, a plethora of other commonwealth acts are also relevant to its management, for example the Environment Protection & Biodiversity Conservation Act (1999) , and the Environment Protection (Sea Dumping) Act 1981. Within the Australian federal system, Queensland state legislation is also relevant. For example, almost 50% of the State islands within the GBRWHA are National Parks under the (Queensland) Nature Conservation Act 1992. In some areas within the GBRWHA, the tidal lands and tidal waters are declared as State Marine Parks under State Marine

Park legislation (Marine Parks Act 1982) to complement the provisions of the adjoining Commonwealth Marine Park.

By and large the planning and management of tourism to the Great Barrier Reef has been very successful in ensuring environmental sustainability, and would demonstrate clear integration of sustainability principles into policies and programmes (MDG goal 7a). In many cases the region is upheld as an example of world-class planning practice, with significant recognition of the issues of connectivity and consultation relevant to such a large natural area. It is important that this planning is adaptive to future threats and opportunities, especially that of global warming and resultant coral bleaching, which occurred on a significant scale in 1998 and 2002. In addition certain commentators have suggested that federal and state governments see the Great Barrier Reef as a tourism ‘cash cow’ (Mules, 2004). Without fair reinvestment of the significant returns from tourism to the region, adequate planning for the future may be jeopardised.

Chapter Summary

This chapter has shown the central position of environmental sustainability in achieving all other MDG outcomes in a marine setting. Because our oceans are so interconnected, and the users of this resource so diverse, solutions for environmental sustainability must engage all stakeholders including tourism. The Sustainable Livelihoods Approach helps us assess community assets, with natural capital at its core. Indeed, protection of biodiversity is fundamental, but this can only come with effective, and adaptive, management regimes, which itself requires high degrees of community support and long term vision. This is the approach taken by the Great Barrier Reef Marine Park with a highly adaptive and consultative management

regime. Furthermore, ensuring environmental sustainability of ecotourism operators through rewarding ecocertification encourages best practice in the industry.

Additionally, by engaging the main users of the resource in various initiatives, environmental sustainability becomes embedded in policies and programmes, not just in the tourism industry, but in management of the marine environment as a whole.

Discussion Questions

What are the links between environmental sustainability and other MDG goals in the marine environment?

What are some of the specific challenges faced in marine protection?

Consider the Sustainable Livelihoods Approach in a tourism host community. What are the various assets available and how might tourism threaten or augment them?

What are some of the methods that the Great Barrier Reef Marine Park Authority uses to monitor and protect biodiversity?

How does the Great Barrier Reef Marine Park Authority foster inclusion of stakeholders in its management regimes?

Resources

Cater, C. and Cater, E. (2007) *Marine Ecotourism*. CABI, Oxford

This text examines the wide range of marine ecotourism resources, not only natural, but also cultural and man-made, within the context of other economic activities that may compromise the success, if not the very existence of marine ecotourism.

Covering economic, marketing planning and regulation issues, this book also considers the vital role of marine ecotourism in raising awareness of the significance of the seas and oceans to sustainable coastal livelihoods.

Garrod, B. and Wilson, J. C. (eds) (2003) *Marine Ecotourism Issues and Experiences*. Channel View, Clevedon.

This book introduces the concept of marine ecotourism and assesses its value as a sustainable development option. The first section examines the major issues involved in planning and managing marine ecotourism. The second section examines a range of experiences, based on case examples from around the world, of how those issues are being addressed in practice.

Great Barrier Reef Marine Park Authority (2011) <http://www.gbrmpa.gov.au>

The gateway for the Great Barrier Reef and world heritage area. A large variety of information about the reef, marine planning and policy, sustainable tourism management, as well as links to external sites.

Halpenny, E. (2002) *Marine Ecotourism: Impacts, International Guidelines and Best Practice Case Studies*. The International Ecotourism Society, Burlington, Vermont. A useful guide for practitioners. The book opens with a discussion of what marine ecotourism is and the potential activities involved. The following chapters cover interpretation, guiding, and environmental education, marine ecotourism attractions, design and construction of marine ecotourism facilities, and the development and operation of marine ecotourism businesses. Appendices include a marine ecotourism operator checklist and a list of websites and publications related to marine ecotourism.

Luck, M and Higham, J (eds.) (2008) *Marine Wildlife and Tourism Management*. CABI, Oxford.

This book examines the importance of scientific approaches to understanding and managing tourist interactions with marine wildlife. Drawing from disciplines such as marine and conservation biology and behavioural ecology, the effects of human disturbance on marine wildlife as well as management approaches to moderate these impacts are explored. Social science perspectives are also used to understand consumer demand and the ethical and legislative problems that this demand creates.

Luck M (ed) *The Encyclopaedia of Tourism and Recreation in Marine Environments*, CABI, Oxford.

A comprehensive encyclopaedia that brings together the terms, concepts and theories related to recreational and tourism activities in marine settings. Entries range from short definitions to medium and long articles.

The End of the Line (2009) <http://endoftheline.com/>

A film revealing the impact of overfishing on our oceans. It examines the imminent extinction of bluefin tuna, brought on by increasing western demand for sushi; the impact on marine life resulting in huge overpopulation of jellyfish; and the profound implications of a future world with no fish.

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