

**Opportunities and Constraints of Co-Management:
cases of the Buccoo Reef Marine Park and
the Speyside Reefs Marine Park, Tobago**

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Abstract

In order to understand co-management, the concept must be examined from both the community and government perspectives since its essence is embedded in a framework of co-operation between these two entities. While a commitment for co-operation is an integral component of co-management, it alone will not sustain it. Trust, openness, communication, a belief in the cause, as well as personal and group gain are all critical components of this management approach.

The Buccoo Reef Action Group (BRAG) was formed in the middle of 1999. The Group emerged out of a joint research project among the Tobago House of Assembly (THA), the University of East Anglia, and the University of the West Indies. As a type of community-based organisation, BRAG sought to develop and implement projects related to the conservation and preservation of the Buccoo Reef Marine Park (BRMP), southwest Tobago, in a collaborative effort with the Department of Marine Resources and Fisheries, THA. Unfortunately, after the joint project ended, so did BRAG.

This study examines the opportunities and constraints that a more participatory approach to management of the BRMP presented as well as explores why the potential for co-management was not realised. Moreover, with plans being created to establish a second marine protected area, the Speyside Reefs Marine Park (SRMP), along the northeast coast of the island, there is once again an opportunity for co-management – either informally or formally. The lessons learned from efforts aimed at increasing stakeholder involvement with regards to the BRMP could be influential in helping to ensure successful implementation and management of the SRMP.

It is clear that management and conservation of marine natural resources and areas requires an integration and appreciation for both the arts and the sciences. A multidisciplinary approach that considers the cultural, social, economic, political, and ecological context of each situation is required thereby making the application of general frameworks difficult, but not impossible, so long as those frameworks remain flexible and those contexts are accounted for.

Foreword

The area of concentration of my programme of study is *integrated coastal zone management*. Specific focus is placed on the challenges and opportunities that arise from *co-management* or *stakeholder participation* and *capacity building* with regards to *coastal resource management* and *marine protected areas* in the Wider Caribbean.

Within my programme of study, the concepts of the tropical coastal zone and co-management have been combined by examining how stakeholders can become involved in and influence conservation management decisions. The approach that I have taken to address these issues has been multidisciplinary. Understanding the social, economic, political, and ecological dimensions of environmental problems is critical if conservation initiatives are to be successful; a holistic approach is essential. While much has been written about the coastal zone, co-management, and protected areas, it must be asked how these issues can be combined to stimulate *real* change and action. It is clear that the theory behind co-management and coastal zone conservation makes sense, but how can these concepts be applied to tropical small island nations that are highly dependent on the natural resources that they also need to protect? My programme, through course and fieldwork and through the completion of this major research paper, addresses these issues in an effort to link the theoretical and the applied concepts of integrated coastal zone management.

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Last but not least, for the support of my family and friends from Halifax, Toronto, and Tobago, I cannot thank you enough.

On the sea

Y.N. Kitayimbwa

Overwhelming beauty in thyself displayed,
That soft blue veil in sweeping spray,
Sliding away from me like melting cream;
Wrinkling it thus in sparkling white.
This beauty of yours, I venture to grasp.

Great hidden treasure you seem to hold!
White radiant lights shoot forth from below!
You seem to hold a sun underneath that blue veil!
The peeping fish pride your world more than mine!
The rotting leaf floats dejected, uninvited in your under-
world!
Sea, great mysteries you hide!

Do you also have strikes in that underworld
To make you so troubled when the waves are high?
For while you link remote ends of the earth,
Great men lie unburied in thy bosom fathoms deep:
Many promising sea voyages were left unfinished.
Great is thy service but treacherous thy mood.

Finally answer this charge of mine:
When you roar, and squeak, and boom:
When you proudly dance both to and fro,
Do you mean to say –
Mortals may fly to the moon or shoot into space,
I will keep my place, for so I was ordered?

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Chapter One. “*Earth is a marine habitat*”¹

Yo os quiero decir que esto lo sabe el mar
que la vida en sus arcas
Es ancha como la rena, unnumberabley
pura
y entre las uvas sanguinaras el tiempo ha
púlido
y ha desgranado el ramo de sus hebras
corales
desde una cornucopia de nacar
infinito
- P. Neruda, from “Los Enigmas”
(Bly, Knoepfle, and Wright, 1993)

I want to tell you the ocean knows this,
that life in its jewel boxes
is endless as the sand, impossible to count,
pure
and among the blood-colored grapes, time has
made the petal
and untied its known, letting its musical threads
fall
from a horn of plenty made of infinite mother-of-
pearl
- P. Neruda, from “Enigmas”
translated by R. Bly (Bly, Knoepfle,
and Wright, 1993)

Framework of the Problem

Loren Eisely (c.f. Earle, 1995, ix) once wrote that

[i]f there is magic on this planet, it is contained in water...Its substance reaches everywhere; it touches the past and prepares the future; it moves under the poles and wanders thinly in the heights of air. It can assume forms of exquisite perfection in a snowflake, or strip the living to a single shining bone cast upon the sea.

The importance of water for all life on this planet cannot be overemphasised. Indeed, life began in the sea over 3.5 billion years ago (Earle, 1995). Despite the fact that it is the ultimate source of all life (including our own), that it covers almost 70 percent of the surface of this planet, and our own seemingly insatiable thirst for knowledge, only five percent of the Earth’s oceans have been explored (Rufe, 2001). Significantly more is known about the diversity, abundance, and state, in general, of terrestrially based organisms than those found in the seas. That is not to say, however, that there is no interest in exploring this vast aquatic environment, in unlocking its secrets, and in unravelling its mysteries. Explorers such as James Cook, Charles Darwin, Jacques Cousteau, and Sylvia Earle have all made tremendous contributions to our oceanographic understanding and, in turn, they have increased our appreciation for an environment to which we are intrinsically linked.

While our knowledge may be limited, our connection with water seems to grow – spiritually and geographically. Physically, this is perhaps best exemplified by the fact that well over half of the Earth’s population currently lives along the coast. A dependence on marine and coastal environments for the food, medicines, energy, and minerals that they provide for anthropogenic use has put them at risk. Too often, the sheer enormity of the ocean is equated with the assumption that it is boundless. The repercussions of continuous anthropogenic assault in the form of over-exploitation, pollution, the introduction of exotic species, the changing of coastlines through dredging and filling, and the destruction of integrated terrestrial and coastal ecosystems (such as forests and wetlands) are now beginning to be felt – fish stocks have collapsed around the world, flooding is now a common occurrence, erosion of

coastlines and loss of beaches (and the life that is a part of them) is widespread, fresh and salt water have been poisoned with acid rain, and sea levels are rising.

Earle (1995, 326) writes that one of the greatest threats to our oceans is ignorance – a “lack of understanding, a failure to relate our destiny to that of the sea, or to make the connection between the health of coral reefs and our own health, between the fate of the great whales and the future of humankind.” These sentiments are reiterated by Suzuki (2002), who notes that most of human society fails to recognise that “nature is not separate from us – what we are doing to nature, we are doing to ourselves; we are biological creatures” (Suzuki, 2002). It is the extent of our ignorance and our ability to make these important connections that will determine the degree of damage that we will cause.

All, however, is not lost. Thomas (1979 c.f. Earle, 1995, 327) notes that

[t]he only solid piece of scientific truth about which I feel totally confident is that we are profoundly ignorant about nature...It is the sudden confrontation with the depth and scope of ignorance that represents the most significant contribution of twentieth-century science to the human intellect. We are, at last, facing up to it...We are getting glimpses of how huge the questions are, and how far from being answered...But we are making a beginning, and there ought to be some satisfaction, even exhilaration, in that.

Given that questions are being raised about the ocean, its life, and resources attests to the fact that there is increasing concern about the state of this environment. Moreover, as more information becomes available about the interconnectedness and dynamic nature of the aquatic environment and the fragility of coastal environments and, in particular, coral reefs and their associated ecosystems (that is, mangrove forests and seagrass beds), awareness by government and nongovernment representatives alike of the need to protect them has also increased.

Coral reefs are among the most diverse and abundant coastal ecosystems. Their fragility, complexity, and intricate designs reflect the magic of the oceans that Eisely (c.f. Earle, 1995) so eloquently refers to. These ecosystems have provided shoreline protection from storms, sand for beaches, food, medicines, construction material, and spectacular destinations for travellers seeking beauty, relaxation, and even adventure.

For all of the natural resources and opportunities that these ecosystems provide, coral reefs are at risk. The impact of over-exploitation, destructive fishing practices, coastal development, erosion, siltation, agriculture, deforestation, and pollution all harm coral reefs and, in turn, the coastal populations that rely on their health. At the same time, Spalding, Ravilious, and Green (2001, 11) note that “our increasing understanding of the interactions between humans and reefs, and between terrestrial activities and their downstream impacts in the coastal zone, are allowing for the development of integrated planning” and management. While integrated planning and management have an array of applicable and useful tools and approaches, marine protected areas (MPAs) offer perhaps one of the most comprehensive management strategies aimed at conserving natural areas and resources.

During the General Assembly of the World Conservation Union (IUCN) in Costa Rica in 1988, participants agreed that marine protected areas were

to provide for the protection, restoration, wise use, understanding and enjoyment of the marine heritage of the world in perpetuity through the creation of a global representative system of marine protected areas and through the management, in accordance with the principles of the World Conservation Strategy, of human activities that use or affect the marine environment (Earle, 1995, 329).

While the creation of MPAs marks an understanding of the need to conserve and preserve coastal ecosystems, the establishment of such areas, in themselves, does not necessarily mean protection. Indeed, many marine protected areas that have been created lack the financial and personnel resources and support that are required to make them effective and successful – in essence, they exist only on paper. Such is the case in the Wider Caribbean – of the 207 MPAs in the area, only 14 of them are considered fully managed (Kelleher, Bleakley, and Wells, 1995). An example of a paper park can be found in the Buccoo Reef Marine Park (BRMP), located on the southwest tip of the small island of Tobago (Appendix 1.1, Appendix 1.2 and Appendix 1.3). Though protected by laws and legislation against a myriad of anthropogenic impacts and assaults, the reef complex continues to degrade.

Spalding, Ravilious, and Green (2001) also observe that many of the unsuccessful MPAs have been those that have not received community and stakeholder support. The management of these areas has tended to underestimate or ignore the social and economic importance of the areas for its users who have, in turn, ignored the protected area designation.

It is widely recognised that management efforts can be more effective when they incorporate the views of and work closely with the individuals and communities that are directly and indirectly affected by the decisions made concerning natural resources and areas (Agardy, 1994; Dixon, Scura, and van Hoff't; Ham and Maganck, 1993; Krausse, 1995; McNeely, 1992; and Shafer, 1999). Public involvement in the planning and management processes (also called co-management) can take a variety of forms and can range from simple consultation to active stakeholder participation in the design and implementation of management-based decisions.

Marine protected area management in Tobago can be improved – what currently exists is not enough. Marine resource management remains a low priority in both state and island government activities and without considerable changes, the protected area will continue to degrade. Furthermore, with plans to create a second marine park on the island, this time in the northeast region (to be called the Speyside Reefs Marine Park [SRMP]) (Appendix 1.4 and Appendix 1.5), whether this park will be any more successful given the current political, social, and economic climate is questionable. The purpose of this research paper is to determine the feasibility of instituting an integrated coastal zone management strategy within a small tropical island setting. Specifically, this paper aims to examine co-management of the BRMP and the proposed SRMP from both the government and community levels. The principal objectives of this research paper include:

1. to provide a comprehensive understanding of the Wider Caribbean's tropical coastal zone and the theories behind co-management;
2. to analyse a past attempt at community participation with regards to the BRMP;

3. to determine both the strengths and weaknesses of this experience in an effort to understand how events unfolded as they did;
4. to determine whether a co-management approach to MPA management is appropriate for both (or either) the BRMP and the proposed SRMP; and
5. to outline a possible plan of action that can lead to more effective and participatory management of Tobago's already-established and proposed marine protected areas.

Framework of the Methodology

The methodology of the design of this research work and paper can be divided into three distinct categories:

1. literature review;
2. field research in southwest Tobago regarding the management of the BRMP; and
3. field research in northeast Tobago regarding the management of the proposed SRMP.

Tobago was chosen as a case study because of the opportunity that it offers as a small island trying to manage one marine protected area and to establish another. While much research has been conducted on the health of the BRMP, the state and efficacy of management strategies have been less documented. In an effort to understand marine protected areas and different management approaches that can be applied to them, a review was conducted of published and unpublished literature on:² tropical coastal zones; integrated coastal zone management; the purpose of marine protected areas and their management; the design of management plans; and the theories and examples of co-management around the world. It should be noted that previous research papers that were written for this programme's academic courses have contributed to this paper.³

Among the literature, Agardy (1993, 1994), Boersma and Parish (1999), Bohnsack and Ault (1996), Ehler and Basta (1993), Eichbaum *et. al.* (1996), Kenchington (1990), Salm (1984), Salm and Clark (2000), Sobel (1993), and Ticco (1995) have recently provided interesting perspectives on the opportunities and constraints related to the creation of management plans, the creation, implementation, and management of MPAs, and reflections on the need to conserve the resources and richness of tropical coastal areas. Birkeland (1993), Christie and White (1997), Fiske (1992), Jorge (1997), Petak (1980), Wells and Brandon (1993), and White *et. al.* (1994a) further suggest that an integrated approach to MPA management may increase the success of conservation measures.

This holistic approach to integrated coastal zone management involves not only managing the aquatic regions of the area, but also the adjacent terrestrial areas. That is, in order to fully appreciate and manage the marine protected area and its resources, an integrated approach should be taken that recognises the interconnectedness of coral reefs, mangrove forests, seagrass beds, watersheds, and other coastal ecosystems.

At the same time, efforts should be made to involve those affected by the area in its establishment and management. This reflects Mitchell's (1987, 22) call for an integrated resource management process that includes:

1. multiple purpose, multiple means, multiple participant strategies;
2. blending...various resource sectors;
3. using resource management as a mechanism for social and economic change; and
4. striving for accommodation and compromise.

Important to integrated coastal zone management is a sense of community-building – that is, people with different positions working together to find common interests on how to manage resources. Thus it could be argued that co-management is related to integrated resource management.

Co-management refers to a strategy in which stakeholders and the public, in general, play a role in the planning, decision-making, and implementation processes as they relate to natural resources and/or areas. At the same time, co-management or increased stakeholder participation within the management process does not guarantee successful conservation of natural resources and it is not always the most appropriate management approach (Fiske, 1992; Geoghehan *et al.*, 1999; Salm and Clark, 2000; White *et al.*, 1994a). A top-down, centralised strategy may be effective for areas where capacity, understanding, and awareness are limited. Indeed, there are few real MPA co-management success stories within the Wider Caribbean. This should not, however, preclude efforts aimed at increasing involvement. As per White *et al.* (1994c, 16), popular ecological knowledge, ownership of resources, integration of management initiatives, response to community needs, acceptance of solutions by the community, efficiency and efficacy of solutions, and cultural diversity are factors that can contribute to successful stakeholder involvement. Moreover, as Franklin (1993, 1998), Morley (1989), Bach (1989), and Wright (1989) suggest, a management approach that encourages flexibility, assessment and reassessment, and evaluation and re-evaluation, as well as one that places stakeholders in the centre of (and allows them to be active participants within) the process may increase the likelihood of success – however success may be defined.

A total of five months (from mid-January to mid-June) was spent in Tobago.⁴ Most time was spent conducting formal and semi-formal semi-structured interviews with BRMP stakeholders concerning the state of the reef complex, the role of the MPA, management opportunities and constraints, various MPA management approaches, and stakeholder experiences with and views on participatory natural resource management (or some form of it). Interviewees included THA representatives, nongovernmental organisation (NGO) representatives, Village Council representatives, dive operators (DOs), reef tour operators (RTOs), fisherfolk, and other community members (Appendix 1.5).

Field research in Speyside concerning the establishment of the SRMP was conducted in conjunction with the Department of Marine Resources and Fisheries, Tobago House of Assembly (THA)⁵. This research involved a three-day rapid rural assessment (RRA) of Speyside during which 54 individuals were interviewed about their views on the proposed marine park and its management (Appendix 1.7). A

community meeting was also held two weeks after the completion of the RRA. The results of the RRA were presented at this time and additional questions and concerns that community members from Speyside and surrounding villages had about the future of the area and the MPA plans were raised.

It should also be noted that a significant amount of time was also spent volunteering with the Department of Marine Resources and Fisheries and working on a number of Departmental projects and initiatives. Conferences, workshops, and seminars on sustainability, climate change, and other related issues were also attended.

This research paper is the result of the compilation, analysis, and synthesis of information and data collected through both the literature search and the field research.

Framework of the Chapters

Chapter Two, “The Tropical Coastal Zone and the Theories Behind Co-Management,” is primarily descriptive and theoretical in nature. It provides the foundation on which the rest of this paper is based. That is, a clear understanding of the roles, uses, and needs of the tropical coastal zone is required if the importance of the need to conserve and preserve the area is to be appreciated. The chapter builds upon this information by examining the theories of sustainable development and integrated coastal zone management. The idea that the management of resources, the planning of marine protected areas, the importance of public involvement, and the need for long-term collective social, economic, and environmental goals are also discussed.

Chapter Three, “The Buccoo Reef Marine Park and the Buccoo Reef Action Group: from theory to practice,” presents the first of the two case studies. This case study focuses on the Buccoo Reef Marine Park and the joint collaborative initiative among the THA, the University of East Anglia (UEA), and the University of the West Indies (UWI) to help organise interested community members into a type of community-based organisation (CBO) dedicated to increasing stakeholder involvement in management of the Marine Park. Issues surrounding the motivations for increased community involvement, dynamics between community members and the government, the projects that the Group pursued, and the reasons behind the unsustainability of Group after the end of the collaborative project are examined. The results of this initiative (and this chapter) help to inform both Chapter Four and Chapter Five.

Chapter Four, “The Speyside Reefs Marine Park: the potential for co-management,” delves into the proposed Speyside Reefs Marine Park. This chapter examines the reasons behind the proposed establishment of the Marine Park as well as critically reflects on the area’s draft management plan. The results of the RRA and the public meeting are discussed and suggestions on how to move forward are set forth.

Chapter Five, “Lessons Learned: the management of coastal environments and resources,” is the last chapter of the paper. The purpose of this chapter is to examine the feasibility of co-management of Tobago’s marine protected areas. Lessons learned from the two case studies are presented and a possible plan of action that can help guide increased stakeholder participation is outlined.

Endnotes

¹ Earle, Sylvia A. 1995. Sea Change: A Message of the Ocean. New York: Fawcett Columbine. xiv.

² Literature searches were conducted at Dalhousie University, Halifax, the University of Toronto, Toronto, York University, Toronto, and at the libraries at the Department of Marine Resources and Fisheries, Tobago House of Assembly and Environment TOBAGO, a nongovernmental organisation.

³ Work from the following courses have been integrated into this research paper:

1. ENVS 5104: Planning Processes
2. ENVS 6125: Recreation and Tourism: Planning and Management;
3. ENVS 6131: Environmental Planning;
4. ENVS 6148: Environmental Negotiation and Mediation;
5. ENVS 6599: Marine Protected Area Management;
6. ENVS 6599: Principles of Conservation Biology
7. ENVS 6599: Readings in Coastal Ecology; and
8. ENVS 7101B: Protected Area Management.

Parts of my Plan of Study and field research proposal have also been used within this paper.

⁴ These five months are in addition to the nine months that I spent as an intern with the Department of Marine Resources and Fisheries, Tobago House of Assembly between October 1999 and July 2000.

⁵ "The Department" and "the Department of Marine Resources and Fisheries" are used interchangeably with "the Department of Marine Resources and Fisheries, THA."

Chapter Two: The Tropical Coastal Zone and The Theories Behind Co-management

“Life begins and ends and begins again in the oceans” – T. S. Agardy (1997, 3)

The Tropical Coastal Zone of the Caribbean

The Wider Caribbean

Tropical coastal zones across the world share similar characteristics: they can take on a variety of forms ranging from rocky shores to sandy beaches to lagoons to islands; they can provide habitat for diverse biological communities; they can house numerous resources; and they can encompass complex ecosystem interactions (Ngoile and Horrill, 1993). The Wider Caribbean coastal region is no exception. Made up of the coastal and marine environments of the Caribbean Sea, the Gulf of Mexico, the Bahamas, Turks and Caicos Islands, the Gulf coasts of both the United States and Mexico, and the Caribbean coasts of Central and South America, the Caribbean region is diverse in terms of its biodiversity, economic activities, and its ethnic, cultural, and socio-linguistic characteristics (Stanley, 1995) (Appendix 2.1). It is the coastal environment, however, that represents the essence of the region.

The Caribbean is often conveyed by typical tropical descriptions that are found in travel guides and tourist brochures – as a collection of islands made up of “powdery white sands, clear turquoise waters, lush jungle rainforests, balmy weather and unhurried pace” (Bendure and Friary, 1998, 11). Photographs of the region tend to focus on the inviting palm trees and sandy beaches that line kilometres of coastline. These images reflect a certain amount of romanticism and escapism, but also an appreciation for beauty in nature and the calming effect of water.

This chapter introduces the theories behind integrated coastal zone management after providing background on the complex ecosystem interactions that take place within the tropical waters of the Wider Caribbean. Marine protected areas and co-management, while discussed as separate components are actually approaches to coastal zone management that can inform one another thereby creating a truly integrated coastal zone management system.

Marine and Coastal Environments

Despite the fact that the ocean covers approximately 70 percent of the Earth’s surface (Thorne-Miller and Catena, 1991), relatively little is known about this expansive aquatic environment. It is known, however, that there are at least 34 major phyla within the seas, 16 of which are exclusively marine. The enormity of this number is more apparent when it is compared to the fact that only one terrestrial phyla is entirely land-based (Norse, 1997).

Water is an integral component to all life. Peterson (1990, xiii) writes that “[w]ithout water, there is no life, no storyline.” The importance of this marine environment cannot be overemphasised – “water itself is essential to all life and this water ultimately comes from the oceans. It is, thus, no coincidence that blood and other organic fluids have ionic compositions mirroring seawater. Even with our terrestrial way of life, we carry a bit of our ocean heritage around with us” (Agardy, 1997, 6). Oceans are biologically diverse, affect global processes (such as climate cycles), provide essential resources (including food, medicines, energy, and minerals), and places for recreation for both coastal and in-land populations (Kelleher, Bleakley, and Wells, 1995).

While the significance of the ocean is clear, it could be argued that it is coastal areas that are the most important and valuable places that human beings have thus far settled. Kay and Alder (1999) maintain that between 50 and 70 percent of the human population currently live in coastal zones. Such numbers have placed enormous, intensive, and often competing pressures on a limited amount of space. Before, however, the impact of such stress can be determined, the coastal zone must first be defined.

Definitions of coastal area boundaries can be divided into two categories: scientific and policy-oriented. Even within these categories, however, there is no clear consensus on what the area encompasses. Indeed, the myriad scientific definitions range from the very precise to the very vague, including, but not limited to (as per Carter, 1996, 38):

1. the broad zone between the landward and seaward limits of marine and terrestrial influences;
2. the land-sea interface;
3. a region of transition between two environments, the land and the sea;
4. a narrow band skirting all coastlines wherein land and sea influence each other;
5. the band of dry land and adjacent ocean space (water and submerged land) in which ecology and use directly affect ocean space, and vice versa;
6. at least to the edge of the continental shelf;
7. the area of associated aquatic ecosystems and those portions of tributaries draining into the estuary up to the historic height of migration of fish to spawn or the historic head of tidal influence, whichever is higher; and
8. islands or small nations.

The lack of consensus among the various definitions reflects the very nature of an ever-changing environment. Nevertheless, it is still generally understood, as per Kay and Alder (1999), that such areas:

1. contain both terrestrial and aquatic components;
2. have terrestrial and aquatic boundaries that depend on the amount of influence each environment has on the other; and
3. vary in width, depth, and/or height.

While the scientific definitions attempt to address the influences of the land and the ocean on each other, it must be recognised that such influences are not always known and are often difficult to measure (Carter, 1996). Moreover, anthropogenic impacts and activities on the area are not accounted

for within these definitions; they are purely scientific. In an effort to combine ecosystem functions and anthropogenic activities in a comprehensive definition of the coastal zone, Kay and Alder (1999) suggest that a policy-oriented approach may be more appropriate when management of the area must be considered. Similar to the science-based approach, consensus has not been reached on what comprises or sets the limits to the coastal area. Nevertheless, in terms of policy, definitions of the coastal zone have been subdivided into four broad categories (Kay and Alder, 1999):

1. fixed distances;
2. variable distances;
3. uses; and
4. hybrid definitions.

The definition that is ultimately adopted will reflect the particular coastal areas management issue that is being considered.

The concept of “a real focus” was introduced by Jones and Westmacott (c.f. Kay and Alder, 1999, 6) in an effort to further focus on how particular issues can influence the use, and hence the definition, of the coastal zone. Jones and Westmacott (c.f. Kay and Alder, 1999) maintain that areal foci may include:

1. an administratively designated area (usually determined through a political process);
2. an ecosystem area;
3. a resource base area (for example, fisheries); and
4. a demand area (for example, use for recreation or transport).

Adopting an areal focus approach, however, does have limitations and caution should be taken to ensure that multiple definitions are not applied to one region since this may lead to confusion and possible jurisdictional conflict over that area. At the same time, however, hybrid definitions that incorporate various understandings as well as both landward and seaward limits may be appropriate.

While defining the coastal zone may appear difficult and somewhat arbitrary, the importance of being able to state coastal limits and boundaries is essential, especially when the area must be managed – and with over 50 percent of the human population living at the land-water interface, management of the coastal zone is no longer an option, but a requirement. The difficulty of defining the coastal zone and ensuring that it is integrative – that is, ensuring that it incorporates both natural and anthropogenic influences and impacts – is compounded by the difficulty of fully understanding the uniqueness of the interactions that occur between marine and terrestrial environments.

Biodiversity and The Tropical Coastal Zone

When compared to terrestrial ecosystems, relatively little is known about ocean and coastal ecosystems. The fluid, three-dimensional nature of the aquatic environment allows for widespread linkages at ecosystem, community, and species levels. Indeed, some of the most diverse and complex

marine and coastal ecosystem interactions are found in the tropics and particularly among coral reefs and their associated ecosystems (namely, mangrove forests and seagrass beds).

Before management decisions can be made about the coastal zone, a firm understanding of tropical coastal biodiversity, its different levels, and the interactions among those levels must be established. Famed biologist and conservationist, E.O. Wilson, once wrote:

The most wonderful mystery of life may well be the means by which it created so much diversity from so little physical matter. The biosphere, all organisms combined, makes up only about one part in ten billion of the earth's mass. It is sparsely distributed through a kilometre-thick layer of soil, water, and air stretched over a half billion square kilometers of surface (c.f. Orians, 1997, 87).

But what is biodiversity? Biological diversity, shortened to biodiversity, was defined within the 1992 Convention on Biological Diversity during the United Nations Conference on Environment and Development in Rio de Janeiro as "the variability among living organisms from all sources including *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species and of ecosystems" (United Nations, 1992, 4). Units of biodiversity range from the genetic, to the species, phyla, community (or assemblage) and ecosystem, habitat, and the biome levels – both on the land and in the sea.

Genetic diversity is the "most basic level of biological diversity" (Gray, 1997, 154). It is the source upon which evolution acts and is hence the source of biodiversity at all higher levels (Orians, 1997). Genetic diversity encompasses that within individuals (heterozygosity), among individuals within the same population, and between different populations. Within populations, the potential rate of evolutionary change (and hence diversity) "is proportional to the amount of available genetic variability" (Orians, 1997, 90) – greater variability leads to a greater potential for evolution and diversity among a population's individuals. Between-population variability "is the result primarily of adaptations of populations to local ecological conditions" (Orians, 1997, 90) where locally adapted populations may have genes and gene combinations that have allowed them to thrive under certain ecological conditions. On an evolutionary time scale, exposure to unstable and stressed environments have led to greater genetic diversity both within and between populations since changing environmental conditions promote the emergence of a variety of traits and characteristics. On an ecological time scale, however, studies have shown that stress actually reduces genetic diversity since populations do not have the chance to adapt to the changing conditions.

While the number of species present in a particular area is an important component to biodiversity, it is not species diversity. Rather, this measure actually defines species richness. Species diversity refers to species "weighted by some measure of their importance, such as their abundance, productivity, or size" (Orians, 1997, 90). Orians (1997) states that approximately 1.5 million living species and 300 000 fossil species have been described with scientific names. Estimates of species numbers, however, are based on incomplete evidence. Current estimates of total living species range from ten

million to greater than 50 million. This lack of information is staggering and it is clear that many species will become extinct before they are studied, named, or even discovered.

In terms of marine species diversity, greatest diversity occurs in the benthic¹, rather than pelagic² zones of the oceans and seas. Gray (1997) maintains that this can be partly attributed to the fact that marine fauna originated in benthic sediment. Studies do indicate, however, that within the pelagic zone, diversity is higher in coastal rather than oceanic areas (Gray, 1997). This diversity found within the coastal zone is perhaps no better exemplified than in the tropical coral reefs of the Atlantic, Caribbean, Indian, Southeast Asian, and Pacific Oceans and Seas. Indeed, coral reefs are considered to be among the most diverse and fragile of existing natural environments.

Higher taxonomic categories (orders, classes, and phyla) of the Linnaean biological classification system illustrate the distinctness of evolving lineages. These lineages are important to biodiversity since the evolutionary potential of life on Earth “depends upon the distinctness of evolving lineages, not just the number of species” (Orians, 1997, 97). That is, evolutionary distinct lineages “have been evolving separately for long periods of time [and] have many unique genes and gene combinations that would be lost if those lineages were to become extinct” (Orians, 1997, 97). Moreover, evolutionary lineages provide information about the history of life, allow for integrated functioning of ecosystems through complex species interactions, and provide aesthetic benefits that cannot be quantified. Marine diversity at the phyla level is extraordinary: 34 of the 35 known phyla are marine (Norse, 1997). High phyletic diversity within the marine realm indicates that it is critical to consider not only the number of species within an environment but also the evolutionary lineages of those species.

Taxonomic organisation is only one way to consider biodiversity. Diversity at the community (assemblage), ecosystem, and biome levels may also be appropriate. An ecosystem can be defined as “a set of interacting species together with their physical environment: the smallest self-contained ecological unit of function” (Putnam, 1994, 1), while a community may be considered as an “assemblage of interacting species and the various interrelationships which bind them” (Putnam, 1994, 1). Biomes, meanwhile, are “large ecological unit[s], usually defined by some dominant vegetative pattern[s]” (Meffe and Carroll, 1997, 675). Communities and ecosystems cannot be considered as separate entities since “no ecological system, whether individual, population, or community, can be studied in isolation from the environment in which it exists” (Gray, 1997, 157). Regardless, it is at these levels that species exist and understanding the environment that houses them and the diversity of these environments is essential. Similar to species diversity, there is both within-habitat and between-habitat diversity. The fluid and interconnected nature of the aquatic realm make distinguishing clear ecosystem and community boundaries difficult. Instead of adopting a community and ecosystem or habitat approach, examining biodiversity at a landscape or biome scale may be more appropriate. Furthermore, as Gray (1997) indicates, areas of both high and low diversity at these higher scales are worthy of examination and conservation since it is often areas that are low in diversity that are high in productivity and greatly exploited for anthropogenic use.

General biodiversity patterns found within the global marine environment can be expressed both in terms of latitude and longitude. That is, species diversity increases from the Arctic to the tropics. Moreover, the Antarctic, which is older than the Arctic, is also higher in biodiversity than the latter region; highest biodiversity values are found in the Indonesian archipelago. The biodiversity of this area, termed the “epicentre for evolution” of marine tropical biodiversity (Gray, 1997, 160), can be partly attributed to the multitude and diverse nature of the islands (in size, geological history, and colonising species sources). Moving westward across the Pacific Ocean and into the Indian Ocean, biodiversity values fall irregularly. The lowest diversity is found in the Caribbean. Recent studies (Sanders, 1968; Grassle and Maciolek, 1993; Gray, 1994; Poore and Wilson, 1993) (c.f. Gray, 1997) show additional patterns that indicate that biodiversity decreases from the coastal to open ocean areas. Regardless of the patterns, it is clear that “the sea’s biological diversity and its importance far exceed the attention that humans devote to understanding them” (Norse, 1997, 95). Nevertheless, it is important to have a fundamental understanding of coastal ecological communities and ecosystems if effective and appropriate decisions regarding biodiversity conservation and preservation are to be made and implemented.

Coral Reefs: The Tropical Rainforests of the Ocean

Tropical coral reefs are among the most diverse *coastal* environments: the planet’s 600 000 square kilometres of reef (approximately two percent of the total sea bottom) provides habitat for over one million plant and animal species (Brylske, 1997). Hinrichsen (1997, 554) describes a scuba diver’s view and impressions of the beauty and biodiversity of these ecosystems: “the first thing that strikes a diver swimming through clear, tropical waters towards the life-laden surface of a coral reef, with its kaleidoscope of sponges, starfish, sea slugs, and myriad schools of colourful, darting fish, is the sheer abundance of living things.” Indeed, coral reefs are teeming with life – both on the surface and within its small crevices and under rocks and rubble. The importance of coral reefs, however, extends far beyond their beauty and their support of recreational activities such as scuba diving. They also provide homes and nursery grounds for countless numbers of fish and invertebrate species, provide sand for tropical beaches as well as construction materials, act as barriers against waves, support fisheries, and produce materials of medicinal value.

Coral reefs are intricate structures that are built by individual and simple organisms called coral polyps. An animal, the polyp belongs to the group of simple animals known as coelentrates (Laydoo, 1991) and are found in all of the world’s oceans and at all depths (Spalding, Ravilious, and Green, 2001). A large number of corals are colonial animals. They secrete their skeletons from their bases and use strands of tissue that extend laterally to connect to their neighbours. Among these corals that establish a communal skeleton are those that are hermatypic (or reef-builders). These corals are able to produce stony skeletons of calcium carbonate. It should be noted, however, that these types of individual coral polyps are not only dependent on other coral polyps for their survival, but also on zooxanthellae, single-celled algae. Within this mutualist relationship, the zooxanthellae photosynthesise, make food for

themselves, absorb carbon dioxide from the water, and feed on the coral polyp's waste products. These activities, in turn, help the corals to build their own skeletons and to respire. In addition, corals are able to gather the nutrients that they need by filtering them from the surrounding seawater and by feeding on the zooxanthellae (Laydoo, 1991).

As coral polyps grow, reproduce, and die, their limestone skeletons grow on those of previous generations and in some cases, those that have existed for tens of thousands of years. These build into the coral reef structures that are seen today. It is important to remember, however, that the only live part of the coral reef (in terms of corals) is found on the surface, where the polyps flourish.

The process of building a reef is far from simple. Indeed, the laying of a stony skeleton is only one part of the process. Interactions with the physical surroundings and other organisms that depend on the reef for food and habitat also determine its shape, size, and strength (Spalding, Ravilious, and Green, 2001). That is, their rigidity is often dependent on the secondary overgrowth of other organisms (for example, coralline algae) and/or their cementation processes as well as on bioerosion. Once corals die, they are subjected to both physical and biological breakdown – wave action can destroy parts or all of a reef depending on the force exerted; grazers break off bits of carbonate substrate; and other organisms burrow into the reef seeking shelter. The sediment created may either be washed away or it may remain on the reef and be reincorporated into the framework. Thus, the internal fabric of the reef is determined by the initial carbonate production, the type and intensity of bioerosion, the levels of secondary cementation and encrustation, and the patterns of sediment storage within or removal from the reef. In essence, reef accretion is a dynamic process that involves not only actual coral growth, but also the breaking down and boring of the reef (Glynn, 1997).

Reef development is affected by macroscale, mesoscale, and microscale factors (Hubbard, 1997). Macroscale factors occur at the global level and in large areas. These factors include tectonics, sea levels, and reef accretion under the influence of sea-level change.³ Mesoscale factors refer to those that are usually physical-oceanographic in nature and those that tend to take place within basins or oceans over different time periods. Such factors include temperature, salinity, wave energy, and storms.⁴ Microscale factors are those that affect organisms at the reef level and are thus related to light, nutrients, sediment, and antecedent topography.⁵

There are five principal structures that a coral reef may adopt/develop into. These include fringing reefs, patch reefs, bank or platform reefs, barrier reefs, and atolls (Appendix 2.2).⁶ Of course, in reality, coral reefs may not adhere to the strict definitions of these particular kinds of reefs and may in fact be hybrids or only similar to them. Moreover, there are coral communities around the world that perform the same ecological functions as coral reefs, but do not assume the clear physical structure of a reef (Spalding, Ravilious, and Green, 2001).

Similar to the general patterns of the world's biodiversity, coral diversity also exhibits patterns whether it be at the global, regional, reef, or colonial scale. Spalding, Ravilious, and Green (2001) maintain that it is the actual coral organism that drives reef distribution. Most reef-builders are

scleractinians.⁷ Indeed, over 790 species of scleractinian coral have been identified as reef-builders and can be found primarily between the Tropics of Cancer and Capricorn (Appendix 2.4 and Appendix 2.5). Spalding, Ravilious, and Green (2001, 19) suggest that a number of fundamental observations can be made concerning the distribution and diversity of scleractinian corals:

1. corals and coral reefs tend to be “restricted to a narrow band of low latitudes, with diversity diminishing fairly rapidly along latitudinal clines;”
2. there are two distinctive regions of coral distribution with one being centred around the Wider Caribbean and the other extending from East Africa and the Red Sea to the Central Pacific (also known as the Indo-Pacific);
3. diversity is highest in the Indo-Pacific and much lower in the Atlantic;
4. coral diversity is greatest around insular southeast Asia; and
5. the western shores of the Americas and West Africa exhibit restricted coral diversity and reef development.

Factors influencing coral reef distribution and diversity are both internal (due to interactions among and within reef systems) and external (macro, meso, and microscale factors).

Factors that influence the health of coral reefs, and in particular, those found in the Caribbean, are equally (if not more) complex as those that influence coral reefs, themselves. Indeed, Caribbean coastal ecosystems are characterised by intricate relationships between three distinct ecosystems: coral reefs, mangrove forests, and seagrass beds.

Mangrove Forests and Seagrass Beds: interconnected ecological systems

Mangrove forests are found on almost every coastline in the Wider Caribbean – although there are variations in coverage depending on the individual geographical characteristics of the islands (Kelleher, Bleakley, and Wells, 1995). While there are over 50 different species of mangroves, the red (*Rhizophora mangle*), black (*Avicennia germinans*), and white (*Laguncularia racemosa*) mangroves are the most widely distributed in the Caribbean. They can grow into trees that are taller than 40 metres or as short as one to two metres, depending on the environment in which they develop. There is also horizontal variation that is dependent on the availability of water (a function of tidal inundation, rainfall, and evapo-transpiration), the supply of nutrients, and stable substrate.

These forests thrive at the land-water interface – the area where fresh and salt water meet. They are among the most productive and important coastal habitats – according to Carter (1996), these ecosystems can produce over 23 tonnes of leaf litter, flowers, and branches in a single year – all of which becomes scattered on the mangrove forest floor. These materials are important sources of organic matter that in turn provide energy and minerals to aquatic food chains. In addition, mangrove forests also serve as nursery areas for a variety of animals, and in particular, for shrimp and fish. As heterogeneous environments, they also provide a variety of niches, specialised areas of use, and hiding places to many other species; they protect shorelines from erosion; serve as sediment traps (which protect both coral

reefs and seagrass beds from smothering, suffocation, and additional stress); filter contaminants and nutrients (again, protecting coral reefs and seagrass beds from pollution from nutrient inundation); and provide a buffer to swamp forests which are intolerant to saline conditions (Carter, 1996).

Although more studies are now being conducted on seagrass beds, they continue to be the least understood of the nearshore coastal environments. Located between the coast and coral reefs in the lower intertidal regions (and to depths of up to 30 metres, depending on the availability of light), they are comprised of various marine flowering plant species. The Caribbean region is one of the areas of greatest seagrass diversity. The most common species found in this geographic area is turtlegrass (*Thalassia testudinum*), although other species of *Halodule wrightii* and *Syringodium filiforme* are also common (Kelleher, Bleakley, and Wells, 1995). These plants form dense and productive meadows in sheltered sand, coral rubble, or mud substrates. Their intermediary location leads them to have important linkages with other coastal ecosystems, including coral reefs and mangrove forests. In addition to being highly productive, seagrass beds act as filters that remove particles that wash from the land into the sea. Their roots also help to keep the sandy lagoon bottom from moving and changing. By doing so, they keep the water over coral reefs clean and clear. Fish and other sea life graze on the grasses and find shelter from predators within the beds. They also act as nurseries for many species and release oxygen into the water (Carter, 1996).

Threats to the Caribbean's Coastal Ecosystems

Despite the importance of these rich ecosystems, coral reefs, mangrove forests, and seagrass beds are at risk. Wilkinson (paraphrased by Brylske, 1997, 29) observed in an address to the Seventh International Coral Reef Symposium that

perhaps as much as 10 percent of the world's coral reefs are already degraded beyond recovery. [In addition,] another 30 percent are likely to be lost within 10 to 20 years, and still another 30 percent within 20 to 40 years thereafter. That means 70 percent of the world's coral reefs could be dead by the middle of the [21st] century.

It should also be stated that the World Conservation Union has found that human activities have damaged coral reefs in the waters of 93 of the 103 countries in which they exist (Brylske, 1997) (Appendix 2.5 and Appendix 2.6).

Threats to coral reefs and their associated ecosystems are both nature- and anthropogenic-based. Natural stressors include severe storms, freshwater inundation, exposure to the air during extreme low tides, and weather anomalies such as the El Niño (Brylske, 1997). Natural threats, however, are not considered devastating. Indeed, as Brylske (1997) and Hubbard (1997) suggest, natural stress may help coral reefs achieve higher biodiversity through disturbance and by opening new habitat. Coral reefs have been able to withstand such stressors for hundreds and thousands of years. It is clear that anthropogenic-induced changes and destruction have caused much damage (that are at times irreversible) to these fragile ecosystems. Brylske (1997, 35) explains:

Population explosions in developing countries of the tropics and massive migration to coastal areas have put enormous pressure on all coastal resources, especially coral reefs. Unlike in preindustrial societies, which have had minimal impact on the coastal environments, the industrial world's heavy machinery, mechanical dredges, and other building innovations easily transform the coastal zone into cities and resort communities without regard to the effect on nearby reefs [and their associated ecosystems].

To compound the problem, agriculture, industrial, and domestic discharges overwhelm the coastal zone with nutrients. This inundation of an ecosystem that thrives in eutrophic waters with nutrient-rich substances leads to the growth of macroalgae and the subsequent suffocation of the coral. Moreover, the destruction of mangrove forests through reclamation for coastal development, the provision of wood for burning and building, and the creation of boat channels and marinas have greatly reduced the buffer zone between land and water. Coral reefs are not the only ecosystems affected by such development; seagrass beds are equally sensitive. Indeed, sedimentation and eutrophication are the greatest pressures that threaten these poorly studied ecosystems (Carter, 1996).

Other anthropogenic-induced stresses on the marine environment are both land- and water-based. Over-fishing, destructive fishing practices, and coral mining contribute to the degradation of these coastal ecosystems. While coral reefs are among the Earth's most biologically productive and diverse ecosystems, they are unable to support intensive fish harvesting – most of what is produced by the ecosystem is also used by it. Moreover, "traditional" fishing practices of the Southeast Asian region (that are fortunately not prevalent in the Wider Caribbean), in particular, have also had profound negative effects on coral communities. That is, dynamiting and cyanide poisoning are fishing techniques that not only kill targeted fish species, but also much of the surrounding marine life. Cyanide is also used as a tool to help stun and capture fish for the aquarium live fish trade. Unfortunately, over 50 percent of the fish captured do not survive (Brylske, 1997).

The negative impacts of destructive fishing activities and development initiatives may be considered easily recognised, quantified, and in turn rectified (although this is not always done). It should be noted, however, that marine recreational and tourist activities have also affected the marine environment. Indeed, in the past, "mass tourism developments... exploited coral reefs for short-term gains without consideration of the long-term impacts" (Sweeting, 2001, 1). Negative impacts of these activities have been caused by the anchoring of boats, the disturbance of marine organisms' natural behaviour, and incidental and intentional removal or damage to corals by visitors (Medio, Ormand, and Pearson, 1997). Coastal development related to the recreation and tourism sector (including, but not limited to, the building of hotels, restaurants, and beach facilities in addition to increased sewage and grey water runoff) have compounded the level of pressure placed on Caribbean coastal zones.

Bartelmus (1994) examines the extent and impact of biodiversity loss. He estimates that by 2020, approximately a quarter of the all of the Earth's biodiversity would be in serious danger of extinction. In terms of numbers, this would mean that between 5000 and 150 000 species would be lost annually. Due to the complexity and interconnectedness of ecosystems (typified by tropical coastal ecosystems), species, and genes, fully understanding biodiversity and its importance is difficult – its value is beyond

measure. Mass extinction has already begun and human societies have felt the repercussions. Protecting what is left is essential.

Managing the Caribbean's Coastal Zone

Ecological Health, Integrity, and the Conservation of Tropical Coastal Biodiversity

Efforts aimed at protecting coastal and marine ecosystems have lagged behind terrestrial conservation initiatives. Three-dimensional and nebulous boundaries that distinguish different aquatic communities and ecosystems from each other, geographically widespread ecological connectivity, and "hierarchically-nested spatial and temporal scales" (Agardy, 1997, 83) make the terrestrial approach (one primarily based on conserving *structure*) somewhat limited in the marine realm. Instead, efforts aimed at protecting and conserving ecosystem function, health, and integrity – all of which will help to maintain structure – should be placed at the forefront.

The idea of understanding and applying conservation methods at a functional level is not new. Indeed, it reflects Laycock's Gaia Hypothesis of the late 1970s which states that "living organisms as a whole play the predominant part among the components that comprise the global ecosystem" (Sachs, 1999, 118) – or, to use an oft-quoted statement, the sum is greater than the individual parts. This is not to say, however, that function and process are more important than structure, but rather that the latter cannot be maintained without the former; a more holistic ecological approach must be assumed. In order to do this, efforts should be aimed at controlling anthropogenic use of natural areas and resources, rather than controlling the actual areas and resources themselves. That is, as Meeker (1974 c.f. Peterson, 1990, 102) writes, less time should be spent "trying to change the world and more time trying to change ourselves to fit the world." Following from this, ecological integrity of any ecosystem must be ensured and this requires managing the anthropogenic activities and impacts on these environments.⁸

Managing coastal and marine environments is both an art and a science. Agardy (1997) suggests that science can play a critical role in advancing conservation biology as well as management policies and programmes. That is, according to Agardy (1997, 84), science can be used to:

1. define the ecological bounds of the system and the appropriate geographical framework for management;
2. identify ecologically critical processes and areas and allow the ranking of an area's importance based on biodiversity or other criteria;
3. assess the scientific feasibility of a conservation or management project;
4. define management units for species of special concern;
5. determine what levels of resource use can be sustained and with which technologies;
6. highlight the sectors in which integration of resource management is required; and
7. monitor to see if conservation objectives are being met.

A number of studies have stressed the importance and benefits of applying sound scientific knowledge to conservation initiatives (Agardy, 1995a, 1995b, 1997; Dight, 1995; Eichbaum *et. al.*, 1996; Goeden, 1979;

Lauck *et. al.*, 1998; Polunin, 1983; Salm, 1984; and Sobel, 1993). Unfortunately, more often than not, important baseline scientific data is lacking. While research will continue to be done on coastal environments and information will continue to accrue, management decisions must be based on that which is already known. Moreover, decisions and action should be taken even if all of the facts have not been gathered and/or assessed, since, as the Ministerial Declaration on Sustainable Development states, "it is better to be roughly right in due time than to be precisely right too late" (c.f. Bartelmus, 1995, 129).

It must also be recognised that in addition to the need for scientific information to help guide decisions, social, cultural, economic, and political circumstances and considerations will also greatly influence the direction of conservation-oriented management programmes and initiatives. There clearly needs to be a balance between the natural and social sciences as well as a balance between use and protection. Moreover, it cannot be forgotten that ecological health and integrity lies at the heart of the conservation concept. A marine protected area is one type of conservation measure that is aimed at achieving such balance.

Integrated Coastal Zone Management and Sustainable Development

Calls for an integrated approach to resource management are not new. Indeed, as early as 1972, international support was granted for the United Nations Stockholm Declaration that included, as one of four fundamental principles, the statement:

In order to achieve more rational management of resources and thus improve the environment, states should adopt an integrated and co-ordinated approach to their development planning so as to ensure that development is compatible with the need to protect and improve the human environment" (c.f. Kenchington and Crawford, 1993, 109).

Although there has been a general recognition of the need for a comprehensive natural resources and area management regime for the past 30 years, how such a programme would be implemented remained, for the most part, relatively abstract until the late 1980s.

The 1980s and 1990s were marked by a flourish of literature and studies on the concepts of sustainable development (Bartelmus, 1994; Clow, 1998; Daly, 1990; de Graaf, Musters, ter Keurs, 1996; Ekins, 1993; Lélé, 1991; MacNeill, Winsemius, and Yakushiji, 1991; Nagpal, 1995; Palmer, 1992; WCED, 1987) and ecosystem-based planning and management (Batisse, 1990; Kenchington, 1990; Kenchington and Agardy, 1990; Miller, 1999; Mitchell, 1986; Olsen, Tobey and Kerr, 1997; Petak, 1980; Slocombe, 1993). Indeed, as Vallega (1999, 9) notes, the 1980s was a decade of "fast and strong development of conceptual tools,...intense debate within the scientific community,...increasingly close interaction between scientific bodies and decision-making systems," and of the United Nations assuming a more prominent role – all of which led to more attention being paid to coastal zone management and the resulting maturation of the field of study (Appendix 2.8). Olsen (1995 c.f. Vallega, 1999, 9) agrees that there was growth in the conceptual understanding of what comprises "appropriate" coastal zone management when he writes:

We have progressed since the early 1970s from coastal zone management (CZM), which recognized some of the more obvious development 'mistakes' and social conflicts along the shorefront and responded with various forms of regulation to ICM [(integrated coastal management)] that attempts to address the assumptions and policies underlying the development process and to experiment with new approaches to governance at the community level and within the agencies of central government.

According to Vallega (1999), this change or improvement, however, did not occur in a vacuum; it was greatly influenced by three overarching factors:

1. global change (particularly related to climate change and a realisation that policies and programmes related to the coastal zone – which would be and has been tremendously affected by such change – would have to be adopted);
2. epistemological changes (represented a move towards applying the theory of complexity to the coastal zone which recognised the need for multi-sectoral and multi-party management systems); and
3. sustainable development.

To use the World Commission on Environment and Development's (WCED) understanding of the term, sustainable development is defined as a form of development that "meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987, 9). The concept consists of three broad goals that include ensuring the integrity of ecosystems, economic efficiency, and social equity (of both present and future generations). More specifically, according to the WCED (1987, 49), policies that would emerge from sustainable development included:

1. reviving growth;
2. changing the quality of growth;
3. meeting essential needs for jobs, food, energy, water, and sanitation;
4. ensuring a sustainable level of population;
5. conserving and enhancing the resource base;
6. reorienting technology and managing risk; and
7. merging environment and economics in decision making.

It is this latter strategic imperative, however, that underlies the basic premise of sustainable development. Indeed, according to Clow (1998, 3), sustainable development is actually "concerned with *sustaining economic development*."

The definition of sustainable development seems to indicate that such a form of development can be linked to the gross national product of a country (or countries) and that the two are not in conflict: "technology and social organisation can be both managed and improved to make way for a new era of economic growth" (WCED, 1987, 8). It should be noted, though, that the issue of growth of the economy and its role within the sustainable development paradigm is somewhat controversial with some academics maintaining that sustainable development and unlimited economic growth are possible and others indicating that the two terms are mutually exclusive. As Upreti (1994) suggests, the neoclassical

economic system provides the framework that allows for a modern society based on consumption and a market economy to emerge. This model promoted the achievability of unlimited economic growth. It must then be asked: How can unlimited growth be sustained? Some scholars, including the authors of Our Common Future, argue that as long as “markets internalise environmental costs” (Nagpal, 1995, 34), the goals of both the market system and sustainable development can be achieved. This perspective requires the environment to be considered separate from the economy and in turn, allows for growth to be infinite. While it takes into account environmental damage, the concept also assumes that the environment is replaceable. That is, if any natural product should ever be exhausted, it can be replaced by that which is manufactured. As Upreti (1994, 21) maintains, “the neoclassical economic approach...seeks a technological solution to all kinds of problems.”

Another fundamental issue that sustainable development seeks to address is that of poverty. Poverty is considered to be the principal factor that leads to the degradation of the environment. Therefore, according to traditional economists, economic growth is essential for ending poverty and ensuring preservation of the environment (Lélé, 1991). Unfortunately, the impact of the wealthy on the environment is not deemed to be as worthy of attention.

Antithetically, many other scholars believe that as long as sustainable development is equated with sustainable growth, it remains a paradox. That is, they maintain that growth cannot be sustainable or infinite because it is limited by the environment. Shiva (1992, 189) explains this:

Economic growth takes place through the over-exploiting of natural resources which creates a scarcity of natural resources in nature's economy and the people's survival economy...Nature shrinks as capital grows. The growth of the market cannot solve the very crisis it creates. Further, while natural resources can be turned into cash, cash cannot be turned into nature's ecological processes...[I]n nature's economy the currency is not money, it is life.

In essence, too much emphasis has been, and continues to be, placed on quantity rather than quality. Gowdy (1992,104) describes human society's and, particularly, the developed world's need for economic growth as an addiction and “as with any addiction, the first step is to recognize the problem and take an initial if tentative step towards a solution.” Perhaps the first step is to realise that to develop does not necessarily mean to get *bigger* but rather to get *better*.

Integration and Co-ordination

A clear understanding of sustainable development is essential because the concept lies at the foundation of ICZM. Indeed, Griffith and Ashe (1993, 280) maintain that ICZM has the potential to provide “an adequate framework for the sustainable use and development of coastal and marine areas” (Griffith and Ashe, 1993, 280). Before such a statement can be made, however, sustainable development's goals and objectives must be agreed upon. Instead of approaching sustainable development from the economic perspective, it could be effectively argued that a more holistic approach should be adopted. While maintaining that resource use can be a component of the development process, it is one part of many. Equality, justice, peace, and ecological integrity must also be ensured – this can be accomplished by

adopting an approach that places as much emphasis on community involvement, development, and education (Brikeland, 1993). It can be suggested that this position better reflects the multidisciplinary nature of ICZM, which has been defined as “a continuous and dynamic process that unites government and the community, science and management, sectoral and public interests in preparing and implementing an integrated plan for the protection and development of coastal ecosystems and resources” (Olsen, Tobey, and Kerr, 1997, 157). Thus, ICZM is a process aimed at balancing human needs and use of the environment while at the same time upholding ecosystem integrity and health. This approach advocates a move away from unsustainable (in the economic, ecological, and social senses) forms of development and is based on a more rigorous programme of integration and co-ordination.

Integration within a coastal zone management system provides consistency among policies, actions, projects, and programmes, as well as between the planning and implementation processes. Thia-Eng (1993) proposes that integration can be divided into three components: system, function, and policy.

System integration is based on the spatial and temporal dimensions of the resource. Physical, social, and economic linkages, as they relate to management issues, are addressed. Functional integration considers “linkages among various management actions such that programs and projects are internally consistent with goals and objectives” (Thia-Eng, 1993, 85). By doing so, efforts will complement rather than compete with or duplicate one another. Both system and functional integrity are applied across sectors. Policy integration, meanwhile, ensures “internal consistency of the ICZM program in terms of national and local government policies and management actions” while at the same time maintaining co-ordination and “complementarity and rationalism between programs and projects as well as among concerned public agencies” (Thia-Eng, 1993, 86). Economic development plans must also include ICZM programmes. Indeed, as with sustainable development, the economic component of any coastal zone strategy must be considered. That is not to say, however, that the economic component will dictate the direction of the initiative, but rather marks a realisation that too often economic policies and programmes ignore or fail to fully understand their environmental impacts. By incorporating ICZM into these development plans, the environment (and more specifically, the coastal zone) cannot be viewed as external to the economic sphere, but rather an integral part of it (Appendix 2.9).

Co-ordination allows for cooperation between and among stakeholders and intergovernmental departments and sectors. Institutional co-ordination, in order to be successful and effective, must occur at central and local levels during the planning, implementation, and management phases (Thia-Eng, 1993). This is easier said than done – issues relating to control, power, and responsibility must be fully addressed and agreed upon before co-ordination and cooperation will be possible.

Integrating and coordinating ICZM among stakeholders and institutional bodies also depends on a clear understanding of the very essence of this management approach – this lies in its premises and principles. Fifteen such principles were developed and presented by Clark (1992) – including some that have been discussed previously as well as others that may appear self-evident. Clark (1992, 48-66)

arranges the list in descending order – from those most specific or related to ICZM at the beginning of the list to those that can be more generally applied at the end:

1. the coastal area is a unique resource system which requires special management and planning approaches;
2. water is the major integrating force in coastal resource systems;
3. it is essential that land and sea uses be planned and managed in combination;
4. the edge of the sea is the focal point of coastal management programmes;
5. coastal management boundaries should be issue-based and adaptive;
6. a major emphasis of coastal resources management is to conserve common property resources;
7. prevention of damage from natural hazards and conservation of natural resources should be combined in ICZM programmes;
8. all levels of government within a country must be involved in coastal management and planning;
9. the nature-synchronous (or “design with nature”) approach to development is especially appropriate for the coast (this will be more cost-effective since it works with nature, understands the dynamic tendencies of nature, and attempts to fit itself to what is occurring in nature, rather than trying to change the environment to suit its needs);
10. special forms of economic and social benefit evaluation and public participation are used in coastal management programmes;
11. conservation for sustainable use is a major goal of coastal resources management;
12. multiple-use management is appropriate for most coastal resource systems (such that “economic and social benefits are maximized, and conservation and development become compatible goals”);
13. multiple-sector involvement is essential to sustainable use of coastal resources;
14. traditional resource management should be respected; and
15. the environmental impact assessment (EIA) approach is essential to effective coastal management (EIA seeks “to predict environmental impacts, to co-ordinate aspects of planning, and to submit development proposals” which will allow cause and effect relationships to be determined, improve planning and decision-making, and help government to enforce the decisions that are made).

The Planning Behind Integrated Coastal Zone Management

These principles provide the foundation on which ICZM is based. At the same time, however, integrated coastal zone management cannot be effective unless there is corresponding environmental and socio-economic planning. The form or shape of a planning model is not universal for all coastal areas. There is, instead, a range of planning theories that can act as a guide. It should be noted that certain planning theories do reflect the needs of the coastal zone better than others. Indeed, since the acceptance of ICZM as a viable management approach, coastal zone planners, decision-makers, and

managers have tended to move away from a rational, deliberate planning approach⁹ to one that is more emergent.¹⁰ Of course, most planning processes are usually not either fully deliberate or emergent; they instead tend to be a combination of the two. Such combinations are seen in other theoretical frameworks for planning, for example in those that are more conducive to effective ICZM, including those that are incremental, adaptive, and/or participatory/consensual in nature.

Both incremental and adaptive planning and management approaches recognise that there is a limited amount of knowledge available about ecosystems and that there is much uncertainty about the consequences of current anthropogenic activities on environmental processes. In addition, both models allow for decision-making to be based on experience and learning. At the same time, however, incremental and adaptive methods do diverge in an important way: incremental planning and management “looks at alternatives with limited deviation from the status quo” (Kay and Alder, 1999, 66) and with limited exploration into alternatives and significant consequences. The adaptive approach, meanwhile, is both reactive and proactive. That is, it is responsive to what is occurring while at the same time it attempts to provide alternative measures for possible future situations regardless of the lack of concrete data and information. In essence, adaptive measures consist of

a series of successive and continuous adaptations of human activities to variable, over space and time, environmental and socio-economic conditions. It is anticipatory in that it develops solutions to problems on the basis of predictable future events. It stresses the need for flexibility at each step of the planning process to allow for changes in direction necessitated by changes in goals, revised future predictions, and availability of new evidence (Briassoulis, 1989, 386).

Approaches to coastal zone management are constrained not only by a limited understanding of the environment but also by top-down structural solutions (such as regulatory policies and programmes) aimed at effecting change through minimal communication and interaction as well as through restriction and coercion. In addition to change, instability, uncertainty, and conflict are also promoted (Crance and Draper, 1996) and the potential for effective management and resource sustainability is less likely to be realised. Crance and Draper (1996) suggest that behavioural solutions must be integrated into structural solutions.

Behavioural solutions promote independent changes in individual behaviour (thinking, attitudes, and action) by encouraging a move away from self-interested decision-making. Networking and other forms of interactive communication and the incorporation of ideas and expectations of affected parties into management objectives (in essence, incorporating participation into the planning and management processes) also help to overcome the restrictive barriers of self-interest, mistrust, and variable perceptions of resource amenities. An integration of structural and behavioural solutions is further strengthened through an education programme that is expected to increase an individual’s understanding of the importance of management, cooperation, and sustainability, while at the same time encouraging changes in perceptions, attitudes, and actions of the resource users, interest groups, and the public. This approach recognises that resource planning and management approaches are not only long-term

initiatives, but also that constant feedback, communication, reassurance, and cooperation are essential components.

The adaptive planning and management method can be summarised as an approach to pursuing intentions through a process that is open, flexible, and based upon learning and adapting to changing circumstances and available information. A goal is envisioned and the steps taken to realise that goal are determined through strategies that emerge “as internal decisions and external events flow together to create a new, widely shared consensus” (Quinn, 1980, 15). Action is planned and that action is taken. The results of such action are evaluated. The strategy, its goals, and proposed re-action are reanalysed; flexibility is essential. This approach represents a merging of several processes (as opposed to one that is “pure”) to coastal zone planning and management. It reflects the need to consider the environmental, social, economic, and political circumstances of the area – whether it is at the international, regional, national, or local level.

Marine Protected Areas of the Caribbean

Marine Protected Areas: a definition

Marine protected areas reflect the application of a comprehensive, hybrid approach of incremental and adaptive planning and management. An MPA is defined by the IUCN (1992, 7) as “an area of intertidal or subtidal terrain, together with its overlying water and associated flora, fauna, historical and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment.” The purpose behind their establishment also lies in their provision of places for “inspiration, education, culture, and recreation” (World Tourism Organisation, United Nations Environment Programme-Terrestrial Ecosystem Branch-Industry and Environment Programme Centre, IUCN, 1992, 2). Prior to the 1960s, very few MPAs existed – this could perhaps be attributed to a limited understanding of the marine environment and a belief that managing it was unnecessary; the ocean was viewed as a cornucopia of infinite resources that was impervious to the negative impacts of over-exploitation and abuse. The decades following 1960, however, were marked by a rapid and substantial increase in the number of MPAs established (Appendix 2.10 and Appendix 2.11). By 2000, over 660 marine protected areas covering a total of more than 900 000 square kilometres had been established – 225 of which are found in the Wider Caribbean (Appendix 2.12).¹¹

The concept of a marine protected area can be considered somewhat abstract – as previously stated, the marine environment does not have the same tangible boundaries as its terrestrial counterpart. Protecting resources and areas that are constantly changing whether through the surging and ebbing of tides, the movement of fish and other aquatic organisms, or the erosion and displacement of sand, may seem abstract. Sylvia Earle, marine biologist and acclaimed marine conservationist, eloquently captures this feeling when she writes: “marine sanctuaries are places in the sea, as elusive as a sea breeze, as tangible as a singing whale. They are beautiful or priceless, or rare bargains, or long term assets, or all of

these and more. Above all, they are new and with care will continue to be special places” (c.f. Nicholls, 1998, 87).

The World Conservation Union has attempted to address the vagueness of marine protected areas by further subdividing the concept into six ecological and management categories. These categories are applicable to protected areas found on the land, sea, or a combination of the two. Category I includes areas that are strict nature reserves and wilderness areas. They are defined, respectively, as areas “of land and/or sea possessing some outstanding or representative ecosystems, geological or physiological features and/or species, available primarily for scientific research and/or environmental monitoring” (for example, closed areas and coastal refuge areas) and as “a large area of unmodified or slightly modified land, and/or sea, retaining its natural character and influence, without permanent or significant habitation, which is protected and managed so as to preserve its natural condition” (IUCN, 1994 c.f. Agardy, 1997, 101). No such marine or coastal areas exist. National parks are included in Category II – a “natural area of land and/or sea, designated to (a) protect the ecological integrity of one or more ecosystems for present and future generations; (b) exclude exploitation or occupation inimical to the purposes of the designation of the area; and (c) provide a foundation for spiritual, scientific, educational, recreational and visitor opportunities, all of which must be environmentally and culturally compatible” (for example, marine parks) (IUCN, 1994, c.f. Agardy, 1997, 102). The IUCN defines Category III as natural monuments. These are “areas containing one or more specific natural or natural/cultural feature which is outstanding or unique in value because of its inherent rarity, representative or aesthetic qualities or cultural significance” (IUCN, 1994, c.f. Agardy, 1997, 102). Habitat/species management areas comprise Category IV. This category includes “areas of land and/or sea subject to active intervention for management purposes so as to ensure the maintenance of habitats and/or to meet the requirements of specific species” (includes such areas as those managed for fisheries) (IUCN, 1994 c.f. Agardy, 1997, 102). Category V, protected landscape/seascape, are areas “of land, with coasts and sea as appropriate, where the interaction of people and nature over time has produced an area of distinct character with significant aesthetic, ecological and/or cultural value, and often with high biological diversity (for example, coastal biosphere reserves) (IUCN, 1994 c.f. Agardy, 1997, 102). Finally Category VI encompasses managed resource protected areas that are defined as areas “containing predominantly unmodified natural systems, managed to ensure long-term protection and maintenance of biological diversity, while providing at the same time a sustainable flow of natural products and services to meet community needs” (IUCN, 1994 c.f. Agardy, 1997, 102).

Wells and Hildesley (1999) maintain that it is the latter two IUCN protected area management categories that have the potential to be the most effective (in terms of achieving set objectives) in the marine and coastal environments since they encompass critical areas and a range of interdependent ecosystems. In reality, a balanced network and combination of categories that reflect and cover “a representative proportion of all ecosystems and with objectives that meet a range of ecological and social goals” (Wells and Hildesley, 1999, 82) would perhaps be optimal. Such a network would take into account

the needs of species, ecosystems, and the human communities that depend upon them – thus addressing the critical points that the World Conservation Union has outlined in their definition of an MPA.

Inherent in the IUCN's definition of MPAs and its creation of different categories and protection levels is the idea that not all protected areas will be no-use areas. Indeed, more often than not, MPAs are designated areas that incorporate multiple objectives, uses, and management requirements. Conventional, sectoral, and deterministic (or at the other extreme, incremental) management approaches are no longer sufficient – they can no longer address this “new” reality. Thus, an integrated coastal zone management system that reflects the very nature of these dynamic environments must be adopted.

General Objectives and Goals

The ultimate objective of MPAs is marine conservation: protecting ecosystem function and process while at the same time using marine and coastal resources in a sustainable manner (Agardy, 1997; Alder, 1996; Boersma and Parrish, 1999; Jones, 1994). Specific objectives, however, are numerous. Indeed, objectives will depend on the individual area, the pressures that it is under, and the needs of both the area and the communities that surround it. As Boersma and Parrish (1999) note, MPAs are rarely established for only one reason. Jones (1994) reviewed thirty studies by various authors and formulated a list of fifteen possible MPA objectives. These objectives fall into broader scientific, economic, cultural, and ethical categories and include respectively (Appendix 2. 13):

1. maintenance of genetic and/or species diversity;
2. promotion of research;
3. provision of education and/or training areas;
4. conservation of habitat and biota;
5. baseline monitoring areas;
6. protection of rare and/or important species;
7. promotion/control of tourism/recreation;
8. promotion of sustainable development;
9. re-colonisation of exploited areas;
10. coastal protection;
11. alternative environmental economic arguments;
12. aesthetic value;
13. protection of historical/cultural sites;
14. political reasons; and
15. the intrinsic and absolute value of the natural environment.

Based on these objectives, other broad goals for marine protected area establishment have also been identified. These goals are not mutually exclusive and all are related to how humans value marine and coastal resources and areas. Such value influences the direction, emphasis, and effectiveness of natural resource management. According to Agardy (1997), there are seven broad goals. The first goal is

concerned with the creation of a concrete and tangible amount of area that the general public and natural resource managers alike can focus their attention on. The second goal for establishment is that an MPA provides an area in which different management approaches and techniques can be applied and tested – those that work the best (in terms of efficiency and effectiveness in achieving set objectives) in a limited area can be expanded to include the environment outside of the protected zone. The social benefits that these areas provide are also noteworthy. That is, MPAs provide an opportunity for local communities to become more involved in resource management and can act as a tool for community empowerment and mobilisation.¹²

Information concerning and an understanding of the marine and coastal environments are lacking and this ignorance is greatly hindering management initiatives. The creation of MPAs allows for control and test sites to be created and monitored over a long-term basis. The knowledge garnered from these areas will not only increase scientific knowledge about community and ecosystem processes and interactions, but also help guide management plans so as to make them truly adaptive and integrated.

MPAs may also help regulate the amount of natural resources that are harvested. Since conservation remains as the primary objective of most MPAs, both development (or use) and protection must be balanced. MPAs provide an opportunity for use to be permitted while, at the same time, such use is monitored and limited. Being able to do so will also help ensure that ecologically important areas, organisms, and resources are protected from over-exploitation and destructive extractive methods.

MPAs have the potential to act as buffers against future management mistakes. Inherent in the adaptive management approach to natural resources is the fact that as more information becomes available, management techniques must be reconsidered and reapplied; past mistakes can be learned from – as long as they do not result in irreversible extinction or degradation. One way to prevent such irremediable damage is to adopt a precautionary approach.

At the local scale, MPAs have the potential to be effective in realising their identified objectives and goals. Their efficacy, however, as per Boersma and Parrish (1999, 300), is dependent upon a number of factors, including (but not limited to) how closely the design of the reserve is “linked to the biology of the constituent species and the physics of the local environment,” whether “humans can control the intensity and spread of relevant threats,” and if “the scale of the MPA exceeds the scale of the threat.” At the global level, however, marine protected areas tend to be islands: “islands of controlled and sustainable use and conservation of biodiversity surrounded by a sea of mismanagement, overexploitation, and open access” (Agardy, 1997, 91). Thus, unless MPAs can be designed in such a way that they incorporate ecosystem dynamics and processes and account for the impact of activities outside of its boundaries, MPAs will be destined for failure. Furthermore, while MPAs may offer productive local results, this may not be enough. Indeed, Boersma and Parrish (1999) suggest that at their current sizes and numbers, MPAs cannot reach marine conservation objectives.

Changes at local, regional, national, and international levels with regards to MPA design, implementation, and management need to be made. Many studies (Agardy, 1997; Boersma and Parrish,

1999; Clark, 1991; Dyer and Holland, 1991; Eichbaum *et. al.*, 1996; Margules and Nicholls, 1988; Ray and Gregg Jr., 1991; Yurick, 1988) have indicated that a network of MPAs, in which individual areas act as “single nodes” (Agardy, 1997) within a larger connected framework will be more effective in achieving marine and coastal conservation. The benefits of a regional approach are numerous: a more holistic perspective can be developed, a functional and ecosystem-based outlook is possible, and it can act as a catalyst for regional co-operation to manage and conserve whole ecosystems. This approach is far from easy. Indeed, at the moment, “no internationally coherent system of marine governance exists that is capable of providing the context for management of human activities in the marine and coastal environment that will truly provide for long-term conservation and sustainable use of the biome’s marine biodiversity” (Eichbaum *et. al.*, 1996).

There is a clear emphasis on the need for science to be the underlying factor in the design and implementation of both MPAs and a network of MPAs. Unfortunately, the biology (that is known) behind the creation, design, and management of protected areas often is lost in the political and economic rhetoric that tends to surround these areas. That is not to say, however, that the economy and the culture of an area or region that houses one or more MPAs are not important. Rather, how the ecology, economics, politics, and culture of the area will interplay with one another affect all aspects of the MPA. This is one reason why the adaptive management process is so important: it allows for flexibility and the creation of a feedback loop between science and policy and collaboration between the social and natural sciences.

Design Considerations

It is clear that there is no one cookie-cutter approach to marine protected area establishment because of the myriad of objectives that an area could potentially identify with. Nevertheless, in lieu of the aforementioned potential objectives, certain design and management approaches could be suggested. The design of the area will determine its site, size, and shape as well as the habitats and species that will be included.

Coastal and marine environments are rarely completely restricted; there is much connectivity between different sites and areas principally through ocean currents. Thus, unlike terrestrial species and habitats, endemism is rare and is usually only found with species that care for their young rather than having them dispersed through the water currents. Reasons for protecting particular areas, therefore, are based less on the need to protect critical habitats for endangered species and more on the need to protect critical habitat for species that have economic, recreational, and/or other values or as a good example of habitat type and genetic diversity (Kelleher, 1999).

Most marine protected areas in the Caribbean are coral reef-containing and within these areas, three kinds of habitats must at least be considered for inclusion. These habitats are coral, neighbouring coastal, and linked (Salm, 1984). The coral reef protected area should contain many different coral types so as to “maintain a steady and varied supply of coral larvae” (Salm, 1984, 210). The close interaction

that coral reefs have with neighbouring coastal habitats means that the latter should also be incorporated into an MPA system. These habitats include reef flats, seagrass beds and sand-flats, and mangroves as well as beaches and dunes. Finally, linked habitats (often distant areas such as watersheds) may influence reefs and thus “management must extend beyond the protected area boundaries for reefs” (Salm, 1984, 212).¹³

Important in helping to prevent the extinction of any species within a protected area is maintaining a balance between their extinction rate and their immigration rate. In order to replenish any losses through out-migration, death, or extirpation, a steady source of propagules in the form of eggs, larvae, and/or juveniles must be ensured. Thus, when considering the size of the protected area, it must be recognised that a large reef area may be better equipped to self-replenish than a smaller one (which is important if a reef complex is relatively isolated from other complexes and when in-migration rates are low). Moreover, larger reef areas may be “mosaics of patches in different stages of community development and redevelopment” (Salm, 1984, 212). As with terrestrial protected areas, larger marine protected areas tend to be favoured over smaller ones.

Goeden (1979, 27) maintains that since protected area design and management tends to be “more of an art than a science,” applying the biogeographic theory can help bring some structure to the process. The biogeographic theory is firmly rooted in ecology and dispersal patterns of organisms and can be highly technical. This theory can be used by protected area managers and decision-makers in their efforts to determine the location, size, and number of protected areas that would potentially maximise genetic diversity (which is key to conservation biology) as well as financial and personnel resources (which has become increasingly important during these “doing more with less” times). With this in mind, Goeden (1979, 31) presents a list of rules or guidelines that could be considered:

1. the “total number of species, and hence the proportions of rare and common ones, will be related to the area of the genetically isolated species-pool, whether it be a single reef or a reef-complex, such that larger areas contain more species than smaller areas;”
2. the “species composition of a particular area – especially a small one – will tend to change through time owing to the effects of extinction and immigration; however, the absolute species number will remain relatively constant, barring any environmental changes which would bring about a shift in the extinction-immigration equilibrium;”
3. “where large reefs are concerned, internal barriers may produce what is in fact a cluster of semi-isolated areas which will behave differently in terms of the isolation constant....in the specie/area relationship;”
4. “‘stepping-stone’ reefs with favourable habitat types may have a dramatic effect on the rates of gene-flow to and from larger reefs....Where recolonization is unacceptably slow, from a manager’s point of view, ‘seeding’ should be considered” – moreover, the number of neighbouring habitats has the potential to influence the total number of species; and

5. “where reef areas and isolation are identical, the reef with the greatest habitat diversity will tend to have the greatest absolute number of species” – it is assumed that greater species number reflects greater overall community diversity and should protecting such diversity be a goal for the MPA, “the structural complexity of a coral reef may provide, for the initial decision-making/planning process, an indication of the biological potential of a coral reef and accordingly a desirable direction for the development of a long-term monitoring programme.”

While the objectives of an MPA may vary, the relevance of the biogeographic theory should not be overlooked; it helps to connect species, habitat, and processes in a comprehensive manner. Moreover, decisions made concerning the design of a marine protected area are often based on politics and/or economics with limited biological understanding. The theory provides additional ecological (and perhaps more concrete) support for decisions that are made that reflect more conservation-based objectives. At the same time, it is important to recognise that an MPA may not be “ideal” in ecological terms but this does not diminish its importance so long as it has identified its objectives (Kelleher, 1999).

The optimum size of an MPA tends to be based on a core area of the reef complex that allows for self-replenishment. This is particularly important if the primary objective of the MPA is conservation-based and less so if other objectives take precedence. Salm (1984, 212) suggests that this critical minimum core area “should be that smallest reef area in which all species found in the area each have a 100 percent chance of being found on all reefs of the same size.” Moreover, “the number of coral genera and sub-genera present may be counted as an indicator of minimum core-area” (Salm, 1984, 212). Inclusion/documentation of 95 percent of all existing general and sub-genera in the area is considered sufficient since a disproportionate amount of time would be required to locate the remaining five percent. By identifying genera rather than species, it is assumed that more time can be spent on studying the reef than if all species had to be identified. After the critical core area has been identified,¹⁴ a protected area boundary that encompasses this area is determined. This area aims to maintain ecological process and support systems as well as regulate usage. Finally, a buffer zone boundary is created – the size of which is dependent upon (and will help to mitigate the impacts of) destructive or damaging activities that take place within the linked habitats (Appendix 2.14) (Salm, 1984; Salm and Clark, 2000).¹⁵

Management Considerations¹⁶

Criticism surrounding past designs of MPAs has centred on their small and tightly controlled nature that failed to account for the interconnectivity of marine environments. Fortunately, over the past ten years, advances in MPA design and management have become more comprehensive. Indeed, the biosphere reserve approach is one such effort. Biosphere reserves were introduced through the United Nations Educational, Scientific, and Cultural Organisation’s Man and the Biosphere programme. This programme (as applied to marine and coastal environments) sought to address the limitations of conventional MPA approaches. It recognised the need for large-scale, long-term, and system-wide

conservation techniques (Kenchington and Agardy, 1990). It is a concept that strives to integrate three principal concerns and roles (as per Batisse, 1990):

1. conservation of genetic resources within specific ecosystems;
2. provision of interconnected facilities responsible for researching and monitoring programmes; and
3. association of development and “sustainable” resource use.

To meet these objectives, reserves have specific design and management plans. In its simplest form, reserves consist of core areas of interest in which protection of specific ecological processes and features (rather than individual species) is required. These areas are surrounded by buffer zones of widths dependent upon the core area and the location of the reserve. The buffer zones allow for certain activities (usually development-oriented) as long as they are compatible with the conservation objectives. In turn, buffer zones are enveloped by a transition area. Sustainable resource management practices are developed within these two types of areas through the cooperation of surrounding communities (Batisse, 1990). Since stringent regulations of biosphere reserves would make them ineffective and inefficient to changing conditions both within and outside of the reserves, flexibility is important. It must also be recognised, however, that too much flexibility may also be detrimental. Should transition areas be made too large and the core zone be made too small or if too much adjustment of sizes of either of these areas (after the reserves have been established) be permitted in order to accommodate growing and encroaching human populations, the integrity and health of these core areas may be threatened.

Unfortunately, there is no easy solution to population growth along (and migration to) coastal areas.

Clark (1991) suggests that inherent in the biosphere reserve is an understanding that multiple use is essential. Thus, reserves should be based on calls for sustainability, multiple use, maintenance of a high-quality environment, maintenance of a natural coastal environment, protection of species diversity, conservation of habitat diversity, conservation of critical processes, pollution control, identification of development areas, provision of development guidance, combination of natural hazard reduction and nature conservation, restoration and rehabilitation, and public participation and awareness – all of which can be categorised into the three overarching objectives of conservation, research, and sustainable development.

As of mid-2002, 408 biosphere reserves (terrestrial and coastal) had been established in a total of 94 countries (UNESCO, 2002). It should be noted that many biosphere reserves overlie existing protected areas or clusters of protected areas. Thus, frameworks for protection are already in place – which can either be helpful or obstructive depending on the effectiveness of the existing protected areas. Unfortunately, while many of these reserves meet one or two of their primary objectives, it is rare to find one that is able to perform all three roles. Funding is often lacking for scientific research and long-term monitoring – both of which are needed to support conservation and development initiatives. Moreover, since most biosphere reserves are land-based, marine and coastal representation (especially in the Wider Caribbean where biosphere reserves currently exist only in Cuba and near the Gulf coast of Colombia [UNESCO, 2002]) is lacking.

Batisse (1990) suggests that coastal and marine areas could be ideal reserves – buffer zones and transition areas could extend to countries' Exclusive Economic Zones or the continental shelves. On the land-side, the different ecosystems and the land-use (and the impact of that use on both land and water) of the area should be carefully considered. Batisse (1990) notes that a number of reserves already have coastlines or consist of islands and the boundaries could be extended on both the land- and marine-sides to make them more holistic and effective – in essence, to reflect a more integrated form of conservation and management. At the same time, when funds, budgets, and personnel are already insufficient and overworked, the creation of new or the expansion of already-established reserves may not be possible.

Biosphere reserves may not be politically, economically, or culturally feasible in all areas – and perhaps this is the case in most of the Wider Caribbean. In such cases, MPAs may be more effective in achieving set management objectives. Protected area management is usually concerned more with managing *anthropogenic* impacts and activities on the environment rather than managing the actual natural environment (although this may play a role). MPAs, more often than not, are not strictly preservation areas – as coastal areas become more populated, prohibiting use of any part of those areas becomes more difficult. As with the idea of sustainable development, MPAs must balance protection of important and fragile ecosystems with wise use. MPAs that advocate and allow for multiple use reflect this understanding. The identified objectives and the size of the protected area will determine which activities will be permitted.¹⁷ Specified activities may not be applied uniformly to the entire MPA and thus a zoning plan may be required.

As Kelleher (1999) notes, the zoning plan should provide the foundation for a more general management plan. Indeed, it is the zoning plan that provides “the means by which planners and managers define the purposes for which each part of a protected area may be used” (Kelleher, 1999, 51). Both Kelleher (1999, 52) and Salm and Clark (2000, 45) identified a number of specific purposes for zones:

1. provide protection for critical or representative habitats, ecosystems, and ecological processes through the creation of sanctuaries where disturbing uses are prohibited;
2. separate conflicting human activities including incompatible recreational activities (for example, bird watching from hunting or waterskiing from snorkelling) to increase the enjoyment and safety of the different pursuits;
3. protect natural and/or cultural qualities of the MPA while allowing a spectrum of reasonable human uses;
4. reserve suitable areas for particular human uses, while minimising the effects of those uses on the MPA (permit selective control of activities at different sites, including both strict protection and various levels of use);
5. preserve some areas of the MPA in their natural state undisturbed by humans except for the purposes of scientific research or education;

6. enable damaged areas to be set aside to recover;
7. protect breeding populations of fishes and other organisms for the natural replenishment of neighbouring fishing areas and devastated or over-fished areas nearby; and
8. act as cost-effective means of managing different uses, since manpower and maintenance needs are minimal.

In essence, a zoning plan accommodates multiple use by protecting sensitive habitats from damaging activities, confining intensive use to sites that are able to withstand it, and separating incompatible activities from one another to avoid or limit conflicts.

The first step in creating a zoning plan involves (as per Salm and Clark, 2000), the definition of core zones. These zones are “habitats that have high conservation values, are vulnerable to disturbances, and can tolerate only a minimum of human use” (Salm and Clark, 2000, 46). These areas should have a high level of protection. The core area should be large enough to protect the population of key breeding species, their support systems, and habitats. The area should also include as many different types of habitat as possible. This is most easily accomplished when enough baseline data is available – unfortunately, this is rarely the case. Nevertheless, information concerning the number of species and genera in the area, the distance of the site from human communities and settlements, levels of anthropogenic use, migratory and feeding patterns and ranges of key species, the distance of the site from sources of seeds and larvae for species replenishment, and examples of other successful zoning designs may all be useful (Salm and Clark, 2000).

Buffer zones will allow for limited and controlled uses/activities. According to Salm and Clark (2000, 47), the “buffer surrounds the protected area and is established to safeguard the area from encroachment and to manage processes or activities that may affect ecosystems within the protected area.” Furthermore, watersheds, rivers, streams, lagoons, estuaries, settlements, and other sources of environmental stress should be overlaid on maps outlining the boundaries of both the core and buffer zones. Theoretically, once this information has been synthesised, impacts influencing the health and integrity of core protected areas – even if they are outside the protected area boundaries – can be managed and mitigated.

The idea that there can be a limit to use and abuse is not new. Indeed, this concept, termed carrying capacity, was introduced during the 1960s. Freedman (1995, 547) defines carrying capacity as the level of use “that can be sustained in an area beyond which degradation of the habitat will be caused.” Carrying capacity is thus site-specific and determining it requires long-term study and data – much of which has not been conducted and collected in many Caribbean countries (this can be extended more broadly to the global arena) where financing, personnel, and other necessary resources are either limited or not available. The concept’s analysis is rooted in numerical and computerised calculation. While it is supposed to be “cold[ly] objective” (Salm and Clark, 2000, 54), in practice, it is subjective, especially when it relies on non-scientific data, such as anecdotal evidence. The use of determining an area’s carrying capacity has not been particularly successful in guiding government policy because of its

complex parameters and because managers and politicians are wary of solely relying on computer generated numbers to make their decisions (Clark, 1992; Salm and Clark, 2000). The subjective approach to the concept, however, which is more qualitative and participative has been more useful in helping to control development – especially when it is related to the tourism industry.¹⁸ At the same time, it is, at best, a theoretical model that resource and protected area managers can strive to implement and achieve. For the most part, however, it is just that – theoretical. More realistically, the precautionary principle can be an effective, strong, and important tool that must be applied.

In order for formal MPA management to be possible, a regulatory/legal framework is essential. Of course, this is only true for MPAs that are legal entities and not for those that are informal or voluntary (and that therefore tend to have a history of voluntary compliance).¹⁹ For MPAs that have been established through regulations and legislation, these laws must be enforced. Salm and Clark (2000) suggest that if circumstances exist, a “soft glove” approach to enforcement should first be applied. This approach involves the issuing of explanations and warnings for first offences. Suitable penalties should follow for repeat offenders. Public education and community involvement in surveillance and enforcement are also critical components.

The need for tangible information and data is important if the creation and maintenance of an MPA is to be justified. While baseline data may be needed to help define boundaries and critical habitats during the planning phases, continued data collection will help to identify important issues that need to be addressed after the MPA has been established. As Kelleher (1999) suggests, results from monitoring should be used to inform and adapt management structures and approaches – and this requires acknowledging both successes and failures and how they relate to the identified objectives of the MPA. Moreover, since monitoring and surveillance are long-term initiatives, long-term “working relationships and administrative structures” as well as funding (Kelleher, 1999, 62) are important. Information that has been collected can be used to inform governing bodies and help to secure investment in both continued data collection and MPA management in general.

Lack of financial support for marine protected areas is perhaps one the greatest obstacles to both their creation and management. Declining budgets and emphasis on other important (and sometimes not-so-important) and pressing needs has forced many MPAs to generate most (and at times, all) of the income required to run and maintain themselves (including compensation costs to local people for lost income or benefits).

While marine protected areas may require substantial financial support (either through grants, government funding, or self-financing), they also contain valuable economic resources. Careful management of these areas will allow for these resources to be protected and developed – the essence of wise use. Dixon (1993, 35) states that economic benefits of MPAs range from job creation through the “harvesting” of renewable and non-renewable marine resources to the use of the areas for recreation and tourism activities. While these benefits may be easily quantified, it is difficult to place a monetary value on

others, including the environmental services that some resources provide (for example, reefs buffering coastlines from high-energy wave action).

Many Caribbean islands have used their sandy beaches, hot climate, clear waters, and coral reefs as their tourism pull – tourism accounts for 15 to 30 percent of the gross domestic product (GDP) for many Caribbean island states. Maintaining the health and integrity of the marine resources on which the tourism sector is so dependent is essential and does come with a price. The costs of protection can be divided into direct, indirect or external, and opportunity (Dixon, Scura, and van't Hof, 1993; Dixon and Sherman, 1991). Direct costs are those that directly arise from the establishment and management of the MPA and are therefore both one-time and recurring expenses. Indirect costs are either those that are “borne by others as a direct result of the establishment and operation of the park” (Dixon, Scura, and van't Hof, 1993, 118) (for example, divers damaging fishers' gear) or “any damages caused by wildlife that live in the protected area boundary” (Dixon and Sherman, 1991, 71) (for example, farmers' crops that are eaten or trampled by wildlife). Finally, opportunity costs represent the loss of potential benefits because an area is protected rather than developed.

Despite these costs, the benefits of MPAs are numerous and substantial. Such benefits include those related to recreation and tourism (as previously mentioned), watershed protection (through erosion control, local flood reduction, and stream flow regulation), ecological processes (through fixing and cycling of nutrients, soil formation, circulation and cleansing of air and water, and global life support), education and research, consumptive benefits (fish, conch, lobster, plants, and other wildlife products), nonconsumptive benefits (also termed *in absentia* – aesthetic, spiritual, cultural/historical, existence value),²⁰ and future values (for potential future use). These benefits tend to justify the costs.

Financial support for MPAs can be sought from a number of institutions, not the least of which are national governments who should, according to Kelleher (1999), provide core support. Possible ways to fund marine protected areas include (as per Kelleher, 1999) encouraging donations from wealthy visitors, demanding compensation for unavoidable and damaging activities, and charging for ecosystem services (for example for sewage discharge). Alternative market-based mechanisms include the creation of environment funds and endowment funds, corporate sponsorship, and user fees (Kelleher, 1999; O'Neill, 1993).

The introduction of user fees within marine parks has already been widely applied. These fees, however, have primarily been used to address administrative costs and have not tended to be considered as a way to limit environmental damage and deterioration. The Bonaire Marine Park (BMP) offers an excellent example of how a user fee system can successfully be implemented. Beginning in the early 1980s, efforts were made by the Bonaire government to introduce a user fee system in order to raise funds for park management. However, due to a national and international lobbying campaign, the system was not implemented. Lack of financial resources eventually led to the Park becoming a “paper park” with management and control of the area lying almost entirely with dive operators. While the dive community, and particularly, the Council of Underwater Resort Operators, dutifully took over mooring maintenance,

educating divers, and reporting violations to proper authorities, the government was concerned about the lack of formal management. In response, a report was commissioned which concluded that a visitor fee system was required, a licensing system for commercial watersports operators was necessary, and a new management structure was essential for the proper management of the Park. Funding was made available to institute the recommendations. In terms of the visitor fee system, fees of US\$10.00 have been collected since the beginning of 1992 (Dixon, Scura, and van't Hof, 1993). As exemplified by the BMP, once a user fee system is in place, it can then be used as one method to distribute divers and in turn, prevent any dive site from becoming overly congested and damaged.

There are two steps needed to allocate divers amongst multiple sites within a marine protected area. The first step is determining the ecological threshold – that is, estimating the carrying capacity of each dive site by asking: when are there too many divers? The second step is determining the social threshold: when do people feel crowded in an area? Data (either scientific or anecdotal) are required. After the two thresholds have been established, there can be an introduction of different fees at different dive sites within the marine protected area. When a site is experiencing high visitation and increased damage (but has not yet reached its threshold), higher fees could be instituted. This increase could be countered with a decrease in fee at another site, so as to transfer divers from one site to another (Dixon and Tisdell, 1996). This system is dynamic and therefore requires constant monitoring and regulation. Again, this may be difficult for countries that do not have much access to financial resources that are required to introduce and maintain such a system. Of course, this problem could be partially offset by the user fees that would be eventually collected.

A similar system was instituted on Saba. Learning from the Bonaire experience, international funding for the Saba Marine Park's (SMP) 1987 establishment was provided based on the condition that a visitor fee programme would be instituted. The user fee system was directed at the dive industry with dive operators collecting the fees on a per dive basis. Compliance with the system is based on peer pressure and self-policing and boasts a compliance rate of more than 95 percent (de Meyer, 2000).

Diver user fee systems in the Caribbean are well documented (de Meyer, 2000; Dixon, Scura, and van't Hof; Dixon and Tisdell, 1996) but they are not the only ones that have been developed. Indeed, user fee systems have been applied to mooring buoys (as seen with the Soufriere Marine Management Area in St. Lucia and the SMP) and studies in Jamaica show the potential for hotel and beach fees (Jameson and Williams, 2000). The diver user fee system in Saba was not adequate to support the Park on its own and thus, souvenirs are also sold. These sales represent approximately one third of the SMP's total income.

While generating revenue is clearly important, reducing and offsetting costs are also necessary. Such a balance may be accomplished through co-management,²¹ contracting services to other bodies and institutions, leasing the protected area to a Trust, nongovernmental organisation, or tour operator (although this must be carefully considered and regulated), or cooperating with other MPAs in a network-type fashion to share staff and resources (Kelleher, 1999). Regardless of how funds are generated or

costs are reduced or shared, it is clear that without adequate financial support, a marine protected area will be relegated to “paper park” status.

Support for marine protected areas extends past the financial realm. Indeed, as Brylske (1999, 49) maintains, one of the most important and effective management strategies aimed at protecting coral reef environments is public support and education. Education can occur at two levels: at the information level and the attitude level. As concern about the state of coral reefs grows, more research is conducted, and in turn, more information becomes available for dissemination. However, *knowing* and *understanding* the problems that coral reef ecosystems face and the impact that anthropogenic activities, coastal development, and climate change have on these fragile environments is not enough. Based on the information that is available, there must be a *change in behaviour and action*; knowledge must be transformed into action and, in turn, education can be transformed into support. General (printed materials, audio-visual presentations, and face-to-face interaction) and specific (targeted stakeholder groups) education programmes provide communities “with information and a conservation ethic so that its members can make informed decisions about the use of their resources” (Salm and Clark, 2000, 57). These programmes are not propaganda to promote MPAs, but are rather serious efforts to inform the public, establish rapport, and secure support for the protected area and marine and coastal conservation, in general – and this is essential if management of the area is to be successful. Such support will be garnered when local needs are understood, benefits are shared, and community is consulted and encouraged to actively participate in the actual management of area.

Co-Management: A Collaborative Approach to Marine Protected Area Management

Public Resources and Areas: Protecting Against the Tragedy of the Commons

In 1968, Hardin published the seminal article “The Tragedy of the Commons” in which he argued that the rate of population growth (and any growth, in general) cannot be supported by this planet (in terms of both space and resources) and it is this growth that is leading to a “tragedy of the commons.” The tragedy that Hardin (1968) refers to centres on an uncontrolled system that allows rational individuals to make decisions and take action that supports individual gain. While at the individual level, this system makes sense, at any level above this, however, the system is destined to “tragedy” because every individual is making the same decisions and taking the same actions aimed at extracting as much as possible (because if they do not, someone else will) from a world that is limited in both space and resources. In essence, the planet cannot sustain unlimited and unregulated growth and exploitation. That is, the commons cannot be justifiable or possible in high-population density.

Since 1968, the theory behind “the tragedy of the commons” still stands, but distinction between common property regimes and open access systems has been made (Vivian, 1995). This idea of open access and “inexhaustible resources” (Hardin, 1968, 1245) can be easily applied to the marine

environment where the belief in “freedom of the seas” (Hardin, 1968, 1245) still tends to dominate despite the adoption of international agreements, conventions, and treaties that aim to do otherwise.²²

It should be noted that replacing the commons or an open access regime with one based on private control and property ownership is not always possible, nor is it necessarily the answer. Indeed, Vivian (1995) provides examples where communal systems (that are often traditional as well) have been followed for substantial periods of time without causing environmental degradation. In some cases, traditional (not *conventional*) management approaches may be complemented and supplemented with new resource management techniques and tools (for example, geographic information systems).

With regards to the fishing industry, Kurien (1995) maintains that working fisherfolk must be separated from the capitalists. That is, in coastal communities it is the working fisherfolk who are affected by the crisis that the fishing industry is now in – not the capitalists. Kurien (1995, 254) writes:

The primary reason for this is that the capitalists can easily move out of the fishery while the fishermen are more or less tied to it, owing to a lack of alternative economic opportunities. For fishworkers, their future lies in the sea and its common resources. For capitalists, given their short-term perspective, and under given conditions of investment, the ratio of the commons to the indiscriminate harvesting of the commons to the profits from regulated and sustainable harvesting are large. For them it actually pays to bring ruin to the commons!

Although Kurien (1995) is referring to the fishing industry of the Kerala State in India, it also reflects the situation in many coastal communities throughout the world – and not the least of which those found in the Wider Caribbean.

Traditional resource management systems should not be romanticised; there is evidence that not all are sustainable (Vivian, 1995). In addition, while they may be participatory, some may also be inequalitarian – sectors or classes may be excluded from both the management process and its benefits (Vivian, 1995). On a different note, many traditional systems are being overridden by Western approaches and perspectives. What has existed for thousands of years (not necessarily in a static fashion, but in a way that adapts to changing needs and circumstances) has been threatened by the pervasiveness of Western ideology and culture. As stated previously, however, the answer may not be to revert completely to past/traditional practices (as they may no longer be relevant), but to adopt the *spirit* of those practices. In a way, integrated coastal zone management can be interpreted as such an effort. Moreover, while MPAs, as part of the ICZM approach, have theoretically attempted to address the public-private conflict/issue,²³ there has still been a decline in the health and integrity of many coastal zones across the Wider Caribbean.

This lack of ownership and responsibility for natural resources and areas is not necessarily the result of a conscious decision on the part of local communities. Such apathy is largely due to the economic, political, and, in some cases, “new” cultural systems that replaced existing traditional ones – this has been clearly seen in many parts of Latin America, the Caribbean, Africa, and the South Pacific where European (and American) colonisation and imperialism were rampant (Borrini-Feyerabend *et al.*, 2000). That is not to say, however, that local communities and individuals have not tried to protect their

interests for and individual rights to these resources and spaces. With the adoption of democratic and comprehensive systems of law, these often marginalized and disenfranchised groups have attempted to do just that – either through confrontation, negotiation, and/or co-operation with the bodies that have assumed control over them. It is this latter approach – this effort to involve all stakeholders (the groups and individuals who have an interest in a given area and/or its resources) – that is gaining greater support throughout the world (Borrini-Feyerabend *et. al.*, 2000).

A Move Towards Co-Management

Tropical MPAs, which have been designed, in part, to address the need for coral reef protection and management have not been overly successful. Indeed, only a small number of those established are effectively managed (White *et. al.*, 1994c) – most exist only in legislation and have little, if any, enforcement or management capabilities. White *et. al.* (1994c, 13) state that most MPAs were created one or two decades ago “by marine scientists and conservationists as an attempt to save what was left.” The conventional approach to conservation was based on the natural sciences with little understanding or regard to the social sciences (and, in turn, to the people who were most affected by the MPAs).

The actual design and creation of MPAs has been compounded by traditional, top-down decision-making and management systems. Such centralised approaches tend to be influenced by economics; consultation with and participation of local communities are rare. Thus, the result is often that communities, whose own needs tend not to be addressed by the government, view these marine protected areas as irrelevant and constraining rather than beneficial (White *et. al.*, 1994c). Moreover, governments often lack the financial and personnel resources need to assess, manage, monitor, and enforce the legislation and regulations behind the MPA’s creation. An approach that moves away from the regulatory, legalistic, sectoral, and centralised approach and towards one that is based on public awareness, participation, and cooperation can only help increase the effectiveness and efficiency of MPA management.

The “co” in “co-management” represents collaborative, cooperative, and community. Community, in this case, is “a group of people who consciously share a functional or moral link such as kinship, occupation, place of residence, religion, or values” (White *et. al.*, 1994c 15). The role of the community in management regimes has tended to be relegated to the background – its influence and importance has been underestimated. It is now clear, however, that community participation is key to successful MPAs and integrated coastal zone management.

The co-management process can be divided into a preparation phase, a negotiation phase, and finally an implementation and revision phase (Borrini-Feyerabend *et. al.*, 2000). Moreover, as per White *et. al.* (1994c, 14) co-management, itself, is based on three principle characteristics:

1. All stakeholders have a say in the management of a resource on which they depend. This guarantees their commitment and participation and permits the incorporation of their knowledge, aspirations, and experiences.

2. The sharing of management responsibility varies according to specific conditions. In some cases, much of the authority is in the hands of local community organizations; in other cases, much of the authority rests in the hands of a government agency. In virtually all cases, however, a level of government continues to assume responsibility for overall policy and co-ordination of functions.
3. Social, cultural, and economic objectives are an integral part of the management framework. Particular attention is paid to the needs of those who depend on the resource and to equity and participation.

Theoretically, the success of community participation is dependent on a number of factors, including, but not limited to (White *et. al.*, 1994c, 16-17):

1. popular ecological knowledge which has been acquired and passed down through the generations of area and resource use;
2. traditional management systems which can provide the basis for more contemporary approaches (at the same time, it must be realised that the situations on which such systems were created may no longer exist and therefore whether these systems are still relevant must be examined);
3. integration of management initiatives within the social, political, economic, and environmental contexts in order to foster compatibility between the community and the management regime;
4. response to community needs since communities are involved in the planning process and the identification of activities that should be pursued;
5. community acceptance for the solutions to problems which tends to be greater when those communities are part of the solution-generating process;
6. greater efficiency and efficacy of management since responsibility tends to be delegated, local knowledge and skills are used, and the dynamic nature of the social, political, and economic situation of the community are accommodated (for community skill and knowledge to be maximised, community capacity building is essential);
7. community empowerment - communities can become empowered by gaining management experience and by being allowed to take greater responsibility for their actions and their consequences;
8. diversity of solutions can contribute to programme sustainability since it promotes flexibility, adaptability, and acceptance that conditions may change; and
9. cultural diversity can be maintained (which supports traditional knowledge, and traditional management systems – at the same time, capacity must be built to ensure that communities can deal with this diversity and the competing and conflicting needs and views that it entails; issues of power structure and imbalance need to be recognised and addressed).

While these factors help to ensure the success of community involvement and while increased community responsibility can allow for more effective management systems, the importance of governmental and centralised systems should not be entirely forgotten or discarded. Indeed, a range of participatory management approaches fall between the two extremes of “government power” and “user-group power”

(Jentoft, 2000, 529). Sen (1998) (Appendix 2.16) divides co-management typologies along the government-based/user group-based spectrum into five different categories, while Salm and Clark (2000) have identified six different types of participatory approaches.

According to Salm and Clark (2000, 67), these management approaches include:

1. persuasion or passive participation (an old-school approach that uses techniques to change attitudes without actually involving the public in the planning and decision-making processes);
2. participation through consultation (user-groups are consulted on their views on proposals and management plans but they are not part of the decision-making body and their views are not necessarily incorporated into the final decisions or plans);
3. participation for material incentives (a non-sustainable approach that is based on public participation and contribution of resources for food, cash, or other material incentives);
4. functional participation (while the public may be involved in the decision-making process, the decisions made are usually not the major ones and groups formed are usually oriented towards achieving predetermined project goals and objectives);
5. interactive participation (there is public participation in the analysis, development of action plans, and the creation of local institutions and participation as both the means and ends of the project/plan – this is a sustainable system since people have a stake in maintaining the structures and practices that they have helped to create and implement); and
6. self-mobilisation (the public initiates plans and projects independently of external institutions and agencies).

It should be noted that there is no one correct way to develop or adopt co-management programmes – the tools, techniques, and level of participation are dependent on the political, economic, environmental, and social conditions of the area and the people affected. These, in turn, should also be reflected in the concepts of and approaches to this management system.

Principles, Concepts, and Approaches to Co-Management

Integrating co-management into existing coastal zone management does not necessarily mean discarding current or previous systems. It does, however, require a concerted and genuine effort to adopt concepts and approaches that will allow for collaboration, cooperation, and understanding. That being said, a fundamental set of principles, concepts, and approaches is required to provide a general framework and practice – if all (or some) of these do not already exist, they must be established.

Adaptive management, as already described is an approach based on analysis and reanalysis, on-going evaluation and monitoring, and flexibility. It is also an approach that promotes the sharing and dissemination of information as well as *institutional* learning – that is, it recognises that even if managers, decision-makers, community members, and anyone else involved with the management of coastal zone natural resources were to change, the information and lessons learned remain (Borrini-Feyerabend *et. al.*, 2000). In addition to this, co-management encourages a pluralist approach – a “primacy of people”

(UNDP, 1997). This pluralist approach focuses on “recognising, acknowledging and involving the various actors, interests, concerns and values that exists in any society” (Borrini-Feyerabend *et. al.*, 2000, 9). Thus, the inclusion of communities and/or local people is inherent in the process and ensuring that all stakeholders are included is essential. Identifying the actors is not an easy task and will take time and effort. Moreover, it is important to recognise, as Borrini-Feyerabend *et. al.* (2000, 9) indicate, that “all [stakeholder] views and voices are *equal*, that they all carry the same weight or all equally entitled to participate in the negotiation of the co-management plans and agreements.”

Stakeholders can generally be divided into primary, secondary, and external categories and can be described either by their reliance on the natural resource base or by the amount of power that they wield. That is, as Bunce *et. al.* (2000) maintain, primary stakeholders are those who are directly dependent upon coastal resources (for example, fisherfolk) while secondary stakeholders are those who do not directly use the area or its resources but who nonetheless indirectly rely on its goods and services or whose actions (away from the exact location) may affect the area. Brown, Tompkins, and Adger (2001, 16), meanwhile suggest that primary stakeholders “have low influence over the outcomes of decisions, but their welfare is important to the decision-makers. Often, the primary stakeholders are those who stand to lose the most from a decision – although this is not always the case.” Secondary stakeholders tend to be the decision-makers and implementers and therefore have profound influence over the direction and outcome of those decisions.

Brown, Tompkins, and Adger (2001, 17) have identified a third group, external stakeholders, who they define as “those individuals or groups who can exert an influence over the outcome of a process through lobbying the decision makers but whose interests are not [as] important.” Thus, while people’s participation is central to a collaborative approach to coastal zone management, the level of participation by different stakeholder groups must be assessed and “which stakeholders should be included in the process, who should be consulted, and who should be kept informed” (Brown, Tompkins, and Adger, 2001, 26) should also be determined. It should be noted that secondary and external stakeholders already tend to be involved in the management process. It is often the marginalized sectors of society who fall into the primary stakeholder category and who tend to be left out of traditional management and decision-making systems. Ensuring this group’s active participation is critical if a co-management approach is to be meaningful.

Involving these stakeholders in the governance process should not be viewed as formalised or as any specific activity. Instead, it is on-going, interactive, and built on compromise (Borrini-Feyerabend *et. al.*, 2000). A truly collaborative and participative approach will also seek to instil and invest as much responsibility as possible in the primary stakeholders. Such an approach will involve open communication between stakeholders and stakeholders determining acceptable resource use and access and control procedures in addition to establishing short-, medium-, and long-term culturally appropriate objectives. This is by no means easy and conflicts (which are not necessarily negative) will occur. In order to ensure that conflicts lead to productive and constructive dialogue and negotiation, conflict management may be

required. Borrini-Feyerabend *et. al.* (2000, 12) state that conflict management implies “taking care of disagreements before they generate hostility,” understanding and accounting for power dynamics of the stakeholders involved, and addressing issues of interest rather than positions in an effort to find solutions and alternatives that are common and/or mutually acceptable.

Underlying all of these concepts and approaches is the need for transparency and communication (whether it be personal – one-on-one, inter-personal – among a few individuals, or social – in a group setting, including communities). While all forms of communication are important and can help the co-management process, social communication may foster better understanding, sharing of information, discussion of opportunities and constraints and possible actions that can be undertaken by individuals and the group as a whole. Communication tends to be top-down – predetermined information being passed from a sender to a receiver (who has little influence over that information) – with the purpose to inform, raise awareness, or train (Borrini-Feyerabend *et. al.*, 2000). A different form of communication, however, attempts to build on and develop people’s capacities and capabilities by “building on and strengthening their existing knowledge and expertise” (UNDP, 1997, 14). Furthermore, this communication process, called interactive learning, requires confrontation and dialogue among the stakeholders in order to cultivate knowledge and information (that is socially and culturally appropriate) that will in turn inform and influence local actions and conflict management; the process becomes just as important as the end product.²⁴

It should be noted that while any or all of these approaches, concepts, and principles may be adopted and applied to a management system, it does not necessarily mean that co-management will be possible or will unfold in an uncomplicated way. A move away from the conventional top-down management approach towards one that is more vertical or bottom-up entails dealing with multiple stakeholders, their positions, interests, perspectives, preconceived notions, and conflicts. Results will require both time and patience by all parties involved.

Initiating Co-Management of Marine Protected Areas

The need to develop partnerships with local communities has been recognised throughout the world. Efforts to integrate these local communities as well as area and resource users into the planning and management systems has also been seen worldwide on both the macro- and micro-scales. That is, co-management can be applied to different areas – ranging from the ecosystem (for example, the tropical coral reef ecosystem) to a “confined” area (for example, a marine protected area). Indeed, the general, broad-scale principles, concepts, and approaches of co-management, as discussed earlier, can be applied to MPAs.

In theory, the devolution of power should lead to democratisation where stakeholders have greater influence over the decision-making process, a reduction in dependency, and an increase in community capacity and confidence. At the same time, many local communities do not have the necessary baseline capacity to assume such responsibility and additional effort will be needed to build it.

Such capacity-building efforts should address the lack of awareness of anthropogenic impacts on the environment and its economic, social, and environmental consequences, the “perceived absence of alternatives to their current and often unsustainable resource-use patterns” (Jorge, 1997, 50), the “lack of experience...in developing [an] organized response to these and other problems” (Jorge, 1997, 50), and the lack of connection between stakeholders promoting conservation and those who rely on the resources and areas for their livelihoods. In addition, obstacles related to some governing bodies not wanting to relinquish their power and control over those resources and areas must also be overcome.

In essence, co-management should be marked by an increase in community responsibility and governance (as well as support and capacity) and a corresponding decrease in government influence. If this does not occur, instead of being democratising, devolution of power may give “local elite more power *vis à vis* national entities and enhance the power of the local elite relative to that of less privileged sectors of the population” (Biodiversity Support Program, 2000, 15). Therefore, the *amount* of power and control that is transferred may not be as important as *how* they are transferred and how “tensions arising from shared and sometimes competing authorities can be made to work for long-term conservation by promoting transparency and accountability of decision-makers” (Biodiversity Support Program, 2000, 39).

Legitimising the role of the community is also essential. The community should be allowed to play a lead role in the management of the MPA while the “state [should] act mainly to ensure that equity and civil rights are upheld within the community regime. It may also be called on to adjudicate conflicts between communities and represent larger or national level interests (such as protecting endangered species)” (Dahl, 1997, 42). It should be noted that this represents higher community involvement along the co-management spectrum. If the community does not or will not assume most of the responsibility for the MPA, this does not mean that co-management has not been pursued, implemented, or possible. Rather, it means that a lower level of co-management has been adopted (and there may be room to increase the level of participation – depending on political and/or social circumstances). It should be noted that co-management of MPAs (and the coastal zone, more generally) can be initiated by the community, itself, government bodies, or nongovernmental organisations (NGOs). The result is a government-community partnership. Variation within the power balance continuum “is often dictated by the political structure in the country, traditions of resource management, the capacity of government and its citizenry, levels of trust between them, and a willingness to work with non-traditional partners” (Hildebrand, 1997, 3).

Co-management of MPAs cannot be instituted overnight; it is a long *process*. Moreover, it is clear that if co-management is considered an objective of MPA design and implementation, participation of surrounding communities during all stages of the MPAs creation (planning, implementation, management, and evaluation) is important. Indeed, as the Biodiversity Support Program (2000, 15) maintains, “where you start and where you come from strongly influence where you end up.” Thus, having a proper beginning to the process is essential. At the same time, for MPAs that have already been created and whose management systems are being updated or reworked, an increase in community participation is

also possible. The needs and wants, however, of the local community must be given careful consideration and whether that community is physically, politically, socially, and mentally prepared for increased participation must be noted; if communities do not want the added responsibility they will not take it – this is why communication and public awareness is important.

There is a caveat: it has often been assumed that “when those people most directly in contact with natural resources have the power to decide how to manage them, and have viable economic alternatives to overuse, they will promote the conservation of those resources and, thus, reduce threats to biodiversity” (Biodiversity Support Program, 2000, 38). This is not necessarily true; the link between the two is not an absolute. The relationship between people and the tropical coastal zone is influenced by a multitude of factors, not the least of which are “community ties, links with institutions and individuals outside the community, cultural attitudes about appropriate relations with and uses of nature, and the ability of conservation advocates to promote alliance opportunities convincingly” (Biodiversity Support Program, 2000, 38). Conservation may improve *with* decentralisation, but not necessarily *because of* it.

Regardless of whether or not co-management is being seriously considered by government institutes as a potential management system that could be applied to a specific MPA, in a truly democratised state, communities should be made aware of it as a management system. Even if communities do not push for co-management on their own, this should not be taken as a sign that they do not want it or that they can never be capable of it. Indeed, communities may need to be encouraged to and assisted in assuming a more managerial role over MPAs; benefits from a more participatory management regime must be made clear. In essence, the “process of clarifying roles, building responsibility, introducing environmentally sound management methods and procedures, and ultimately managing coral reef resources for sustainable use must take place through equitable dialogue and partnerships, the focus of which varies according to the particular situation” (White *et al.*, 1994b, 108).

There is no one correct method to catalyse co-management. White *et al.* (1994a) compiled a number of case studies from around the world which exemplifies this. At the same time, however, a general framework for co-management of MPAs can be suggested (Appendix 2.16). The steps (or at least some variation of them) can be broadly outlined and this framework is often reflected in many cases where co-management has been pursued (White *et al.*, 1994b). This framework includes stages of preparation, integration of those involved in the management programme into the community, community education and research, the creation of core management groups, the definition of management objectives and strategies, the implementation of those strategies and the formalisation of responsibility and authority, the replication and extension of the core group and its activities into the wider public arena, and evaluation and adjustment of the programme and process. Gilman (1997) further suggests that community support for and participation within management regimes can be fostered by first informing the public about the potential plans, organising interest groups, establishing a committee to encourage community and interest group involvement, selecting a neutral coordinator to chair the committee, creating momentum by dealing with issues that have easy solutions first and then moving on to ones that

are more difficult and long-term (this requires identifying all issues that are pertinent to all stakeholders), ensuring that all of the interest groups are directly involved, having direct involvement of the decision-makers (which also leads to legitimacy of the process), and balancing the needs of the stakeholders with the need for conservation. Again, consideration must be given to the local context and flexibility within the process is key.

Summary

Water covers over two-thirds of the planet Earth. Its inhospitability to humans has left much of it unexplored. Nonetheless, we are drawn to the water – we need it to survive. Our dependency on this compound and environment, however, has not always led to our appreciation for it. Indeed, we often take its vastness for granted.

With the majority of the world's population living at the land-water interface, we have inundated the oceans with the results and impacts of our activities. In an effort to curb anthropogenic impacts on this environment, legislation and regulations have been enacted throughout the world that outline what can and cannot be done to the environment. These efforts have been largely ineffective. Piecemeal approaches and reductionist strategies tend not work in fluid and dynamic environments. As our understanding of the aquatic realm has developed, so has our management approach. It is now realised that an integrated system that links the land to the water and people to management has the potential, if instituted correctly, to be more successful.

A variety of tools can be used to apply this adaptive and integrated management approach to tropical coastal zones; the creation of marine protected areas is just one of them. While MPAs may have a multitude of goals and objectives, conservation tends to be a high priority. Unfortunately, the creation of MPAs and the laws and regulations designed to support them, have not always been successful. Indeed, there are cases where these areas have actually degraded since their protected area designation. Clearly, something is lacking. It has been argued that in many such cases, the people who have been most affected by their creation (both positively and negatively) have often not been involved in the planning, design, implementation, or management of them. Moreover, this lack of involvement has helped to create paper parks. Attempts to bring stakeholders into the management process have occurred throughout the world, including the Wider Caribbean.

It should be noted, however, that collaborative efforts aimed at managing marine protected areas will not always be successful.²⁵ Even these experiences, however, should not be viewed as failures. They are opportunities to reflect on what happened, to determine what went wrong, and to learn from those mistakes. Indeed, successful attempts at co-management will involve seeing and understanding how existing management systems can be improved, making opportunities for improvement available, and taking advantage of those opportunities when they do arise.²⁶ Mistakes can be costly (in the economic, political, social, and environmental sense), but they do not necessarily have to be so and they do not necessarily have to be viewed as negative. In the adaptive, integrated process that co-management

advocates, improvements are only possible when limitations and obstacles are recognised and confronted – and there is always room for improvement. Such is the case in southwest Tobago with the Buccoo Reef Marine Park as the following chapter and case study elucidates.

Endnotes

¹ Benthic refers to the sea/ocean bottom.

² Pelagic refers to the area within the water column.

³ Fringing reefs in certain regions (e.g. the eastern Caribbean) “exist in an extremely volatile tectonic setting” (Hubbard, 1997,46) while barrier reefs often occur in areas that are tectonically stable. Indeed, the “constant motion of giant fragments of oceanic and continental crust creates dynamic zones of seafloor spreading and crustal collision...[P]redictable patterns of uplift, subsidence, or stability have emerged as important, long-term controls of reef development” (Hubbard, 1997, 46).

Sea levels have risen and fallen throughout geological time. During each period, reefs that lived near the upper limit of each sea-level rise became either flooded or exposed. The result was a “series of reefs, each built upon the remains of its predecessor” (Hubbard, 1997, 47). This reflected Darwin’s theory of the origins of fringing reefs, barrier reefs, and atolls. Darwin suggested that the three were an evolutionary continuum and subsidence was the underlying control. This theory was countered by Daly who maintained that reef character was solely determined by sea level. Deep core evidence supports Darwin’s theory.

Finally, reef development is affected by the rate of relative sea-level rise compared to the upward accretion of the reef and how long the sea level rises at a rate greater than the reef’s ability to develop upward and to keep up. Reefs may keep up, catch up, or give up.

Hubbard (1997) provides a detailed explanation of macroscale factors on coral reef development.

⁴ In terms of temperature, corals found in tropical waters are able to grow in waters ranging between 18 and 36°C with an optimal range between 26-28°C.

Marine salinity levels must be “normal.” That is, salinity levels must be between 3.3 and 3.6 percent.

Wave energy and storms tend to impact the character of the shallow-water reef crest and the zonation along the front of the reefs. For example, where wave action is strong and there are moderate to frequent hurricane disturbances, reefs are dominated by coralline algae since branching corals tend not to be able to withstand impact – they break down and provide ideal recruitment zones for coralline algae. Meanwhile, for areas where there is high prevailing wave energy but less frequent storm occurrence, branching-type corals tend to be found. Reefs tend to be dominated by open sediment pavements and only scattered coral cover in areas where there is low wave energy and frequent storm disruption. Storms tend to discourage the establishment of abundant and diverse reef-crest communities and the low wave-energy creates conditions that encourage grazing – this not only discourages thick algal crusts (since this is what grazers primarily feed on), but also reduces the success rate of coral recruitment (since the grazers may feed on new recruits as well).

Hubbard (1997) provides a detailed explanation of mesoscale factors on coral reef development.

⁵ Light intensity decreases exponentially with water depth and the light spectrum shifts rapidly toward the blue end. In addition, photosynthesis and calcium carbonate production which characterise coral growth and which are partly dependent on light exposure also are reduced. Moreover, coral morphology changes from mounds in shallow water to plates at greater depths since plates are more efficient at light gathering.

High levels of nutrients are detrimental to reef health since they promote the growth of algae that in turn proliferate and suffocate corals.

Corals can survive high sediment loading over the short-term. They, however, cannot survive long-term sediment loading of even lower levels since chronic sediment loading tends to gradually wear down the reef’s defences. Four of the most important types of sediment stress as per Hubbard (1997)

include smothering, abrasion (breaking of the corals), shading, and inhibition of recruitment (which discourages settlement of larvae).

In terms of antecedent topography, many reefs are built upon the remains of their predecessors and this provides a strong foundation on which new recruits can settle, grow, and flourish.

Hubbard (1997) provides a detailed explanation of microscale factors on coral reef development.

⁶ Fringing reefs are the simplest structures to understand. These types of reefs are found along coastlines and are characterised by a shallow reef flat (where growth is most rapid and prolific) on the landward side of the reef crest. On the seaward side, the forereef slopes to the seafloor (Appendix 2.3).

Patch reefs develop on shallow-hard-bottom areas of the sea floor and are primarily composed of sediment. The top of a patch reef is usually exposed above water to form a sand cay or limestone bank. Unlike the fringing reef where most of the growth occurs on the reef flat, most prolific coral growth occurs on the shallow forereef slope of the platform reef.

Bank or platform reefs are similar to patch reefs in that they also develop on shallow-hard-bottom areas of the sea floor, but lie deeper than patch reefs. Moreover, their tops are never exposed and may lie 40 metres below surface. Most of the growth usually occurs on the reef top where light penetration is greatest.

Barrier reefs develop on continental shelves and are separated from the shoreline by a deep, wide lagoon. The lagoon forereef tends to be colonised by fragile corals while the seaward forereef is characterised by calcareous algae and sturdy corals.

Atolls are coral reefs that encircle a central lagoon. Their reef tops are often exposed and small cays may occur. They are typically found in oceanic waters and form on submerged volcanic mountains.

Laydoo (1991) and Spalding, Ravilious, and Green (2001) provide more detailed descriptions of the various reef types and formations that can be found throughout the world.

⁷ Scleractinians have an exoskeleton made of calcium carbonate. Tentacles that surround the polyp's mouth are found in multiples of six and so scleractinians are also known as hexacorals (Laydoo, 1991).

⁸ The Panel on the Ecological Integrity of Canada's National Parks defined the concept of ecological integrity. They state: " 'an ecosystem has integrity when it is deemed characteristic for its natural region, including the composition and abundance of nature species and biological communities, rates of change and supporting processes.' In plain language, ecosystems have integrity when they have their native components (plants, animals and other organisms) and processes (such as growth and reproduction) intact" (Parks Canada, 2000, 1).

⁹ In essence, deliberate planning is a step-by-step process in which action follows intent: a problem is defined; goals and objectives are formulated; implementation strategies are created; post-action evaluation is designed; the plan is implemented; and the outcomes are monitored and evaluated (Lang, 1995). All the steps involve feedback to one another and are continuously being redefined, reanalysed, and reconsidered.

¹⁰ Emergent planning reflects the idea that action, experience, and learning can lead to intent. This form of planning is often considered to be more open and flexible to changing situations and conditions (Lang, 1999). The basis of emergent planning lies in learning – learning is a part of the process as well as the end product. As Lang (1999, 4) states, emergent planning is "knowing, more or less, where you want to go without knowing how you [will] get there."

¹¹ It should be noted, however, that three quarters of the protected 900 000km² lies in two protected sites – the Great Barrier Reef Marine Park and the Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve. Moreover, these statistics only refer to marine sites that protect coral reefs – other MPAs have been established that protect non-coral areas and there are informal marine conservation areas that use traditional management systems.

¹² The issue of empowerment, capacity building, and community responsibility will be discussed in the section entitled “Co-Management: a collaborative approach to marine protected area management”.

¹³ Please refer to Salm and Clark (2000) for a more comprehensive description of these three types of habitats and the interactions among them.

¹⁴ Please refer to Salm (1984) and Salm and Clark (2000) for an explanation on how to estimate critical minimum core area.

¹⁵ Please refer to Appendix 2.14 for possible criteria that can be used for selecting MPAs.

¹⁶ Salm and Clark (2000) provide an informative, clear, and in-depth look into protected area management needs, issues, and approaches.

¹⁷ Activities permitted within MPA boundaries may include (but are not limited to) various forms of fishing (recreational, subsistence, commercial), scuba diving, pleasure boating, swimming, snorkelling, and other watersports.

¹⁸ Studies have been conducted on the use of carrying capacity analysis with regards to dive tourism in the Caribbean. Indeed, the theoretical carrying capacity for dive sites within the Bonaire Marine Park was estimated at 387 000 dives annually. This figure was calculated through determining the number of dives that could potentially take place before critical levels of damage occurred through continuous diver visitation. Through recorded data and anecdotal evidence, it was observed that two sites within the Marine Park showed signs of “wear” during the mid-1980s. The number of dives that were taking place at that time was approximately 5000 per year per site. With 86 potential dive sites and a visitation limit of 4500 annual dives per site, a total of 387 000 should be possible within the Park. The actual number of dives per year, however, should be much less because the “distribution of dives is uneven due to differences in distances and accessibility of sites” (Dixon, Scura, and van’t Hof, 1993, 121). Taking this information into account, a more realist carrying capacity would be between 190 000 and 200 000 dives per year (Dixon, Scura, van’t Hof, 1993). Dixon, Scura, and van’t Hof (1993) caution that much coral cover and species diversity within Bonaire Marine Park could be lost should these levels be exceeded. Please refer to Davis and Tisdell (1996) and Dixon, Scura, and van’t Hoff (1993) for more information concerning the application of the carrying capacity concept to scuba diving within marine protected areas.

¹⁹ Examples of the voluntary approach to MPA establishment and management can be found in the United Kingdom (UK). In a study conducted by Gubbay (1993), the author notes that voluntary MPAs in the UK received more widespread public support than those that were based on the statutory approach. The author suggests that the latter approach is fraught with problems that appear to stem from “poorly drafted and weak legislation” (Gubbay, 1993, 273) that take too long to implement. Indeed, “damaging activities continue to take place in the protected areas and it is difficult to achieve tighter controls” (Gubbay, 1993, 277). The precautionary principle is not deemed important and marine conservation (or even nature conservation, in general) is not considered a priority in UK politics. Moreover, lack of public consultation has often led to feelings of animosity toward both the protected area and those that are trying to establish and manage them. Unfortunately, while voluntary MPAs may be more acceptable, these sites are provided no real legal status, thereby making them vulnerable to threats of coastal development.

²⁰ *In absentia* benefits, according to Pearsal (1984, 7), are “the most significant anthropocentric benefits of nature preserves.” These benefits may go unseen by the majority of society. Indeed, Pearsall (1984) maintains that understanding and educating people about such benefits is important because they provide the “best opportunity to identify the broad constituency for nature preserves and wilderness, and to democratise the nature preserves and wilderness preservation movement[s]. Finally, *in absentia* benefits can, if well recognized and understood, serve to lesson some of the use-pressures on nature preserves” (Pearsal, 1984, 9).

²¹ This is to be discussed in the section “Co-Management: a collaborative approach to marine protected area management”.

²² Such agreements, treaties, and conventions include (but are not limited to):
International Convention for the Regulation of Whaling (2 December 1946);
Convention for the Establishment of an Inter-American Tropical Tuna Commission (31 May 1949);
Agreement Concerning Measures for Protection of Stocks of Deep-Sea Prawns (*Pandalus borealis*), European Lobsters (*Homarus vulgairis*), Norway Lobsters (*Nephrops norvegiaicus*) and Crabs (*Cancer pagurus*) (7 March 1952);
Convention on the High Seas (29 April 1958);
Convention on Fishing and Conservation of the Living Resources of the High Seas (29 April 1958);
Agreement Concerning Cooperation in Marine Fishing (28 July 1962);
Convention for the International Council of the Sea (12 September 1964);
Convention on Wetlands of International Importance Especially as Waterfowl Habitat (2 February 1971);
Convention on International Trade in Endangered Species of Wild Fauna and Flora (3 March 1973);
Convention for the Prevention of Marine Pollution for Land-Based Sources (4 June 1974);
United Nations Convention on the Law of the Sea (10 December 1982);
Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (24 March 1983);
Protocol Concerning Cooperation in Combating Oil Spills in the Wider Caribbean Region (24 March 1983);
Protocol Concerning Specially Protected Areas and Wildlife to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (1990); and
The Convention on Biological Diversity (1992).

²³ This attempt has been made in the sense that these areas tend to be established with conservation as primary objective – that is, allowing controlled use and access while at the same time ensuring ecological integrity and health.

²⁴ While the role of women has not been discussed as a separate issue within the co-management process, it should be noted that women, in some circumstances, could be considered a marginalized societal group. Co-management and participatory development must address issues of gender inequality. Indeed, the UNDP (1997, 14) writes:

people's participation must empower women: participatory development should seek to improve gender inequalities through providing a means by which women can take part in decision making. Women's participation must be transformative, not be merely tokenistic; while there are often enormous social and cultural barriers which hinder women's participation, participatory development should seek to bring about change and to create the circumstances where women's voices can also be heard. This is a sensitive and critical issue, but efforts to involve women in an appropriate manner must be central.

²⁵ Gilman (1997), Fiske (1992), and Forest (2000) provide examples of unsuccessful co-management attempts.

²⁶ Buhat (1994), Fiske (1992), Gilman (1997), Hale and Lemay (1994), Horrill, J.C. (2000) Pajaro (1994), Quirolo (1994); Samarakoon, van Zon, and Verheugt (1998), Siirila (2000), Smith (1994), Usher (2000), van Ingen (2000), and Zerner (1994) provide examples of successful (or at least partially successful) co-management attempts.

Chapter Three: The Buccoo Reef Marine Park and the Buccoo Reef Action Group: from theory to practice

“Tell me and I will forget, Show me and I will remember, Involve me and I will understand” – Confucius

Putting Global and Regional Issues into a National Perspective

While the theories behind co-management and marine protected area design and establishment are interesting, their importance also rests with their relevance and applicability at the functional level. As of 2001, there were 225 marine protected areas containing coral reefs in the Wider Caribbean (Spalding, Ravilious, and Green, 2001) (Appendix 2.12). Of these (as per 1995), only 14 were fully managed – that is, only 14 MPAs in the Wider Caribbean have achieved their objectives (Appendix 3.1). Kelleher, Bleakley, and Wells (1995) have identified (based on the Organization of American States' [OAS] findings and categorisation) 65 MPAs that are only “partially” or “legally” protected (Appendix 3.2). Although the information is somewhat dated and while some of these MPAs may now have better management systems and practices, there is evidence that the number of partially managed areas greatly outnumbers those that are “fully” protected (according to the OAS standards) (Kelleher, Bleakley, and Wells, 1995; Spalding, Ravilious, and Green, 2001). Indeed, Kelleher, Bleakley, and Wells (1995) maintain that the number of these “paper parks” may be as high as two-thirds of the total established.

It is clear that protecting these fragile (and at risk) coral reef environments through the creation of additional MPAs is important, but at least an equal effort must be given to effectively managing existing ones. This will require, *inter alia*, additional funding, personnel, data collection and analysis, and capacity building – which, coincidentally, are also components of a successful co-management strategy. This situation is reflected throughout the Wider Caribbean and is no different on the small island of Tobago. The purpose of this chapter, therefore, is to explore the nature, theories, and concepts that lie behind stakeholder groups and their efforts to become more involved in such marine resources and protected area management in an effort to make them more effective. The specific cases of the Buccoo Reef Marine Park and the Buccoo Reef Action Group (BRAG) are examined.

Tobago's Marine and Coastal Resources

Lying approximately 33 kilometres northeast of Trinidad, Tobago is the smaller of the two-island state – it is only 300 square kilometres, compared to Trinidad's 4 828 square kilometres. Tobago falls between latitudes 11°8'N and 11°22'N and longitudes 60°30'W and 60°51'W (Appendix 1.1). Its warm surface water temperatures that average between 26°C and 28°C throughout the year, relatively minimal turbidity, a salinity that ranges between 32 and 36 parts per thousand during the year, and a volcanic rock-based seafloor has provided optimal coral reef-formation conditions. Indeed, approximately 70 percent of Tobago's calmer eastern and Caribbean coasts are lined with coral reefs. Principal coral reef

sites around the island include those at Man-of-War Bay, Speyside, Goat Island, and Little Tobago to the northeast; Arnos Vale Bay, Culloden Bay, King Peter's Bay, Castara Bay, Englishman's Bay, Parlatuvier Bay, and Bloody Bay to the north; and Little Rockly Bay, Petit Trou, La Guira, Flying Reef, Kariwak Reef, Ketchup Reef, Little Courland Bay, and Mount Irvine Bay to the southwest (Appendix 3.3). Buccoo Reef, also found in the southwest, is the only legally protected coral reef formation in Trinidad and Tobago (Appendix 1.2 and Appendix 1.3).

These reefs support local commercial, subsistence, and recreational fisheries by providing shelter and food in addition to breeding and nursery grounds to numerous important species (including snappers and groupers). While the fishery industry is still relatively underdeveloped, it provides essential opportunities for employment, food security, and stability for rural communities. Moreover, the industry "is by far the main economic support for many coastal communities around the island" (Potts, 2002e). Indeed, according to 1998 statistics, the contribution of the industry to the total agricultural gross domestic product equalled 8.9 percent, while 58 000 Tobagonians were directly or indirectly employed and over 8 600 tonnes of fish (equivalent to over TT\$92.5 million¹) were exported. In Tobago alone, the fisheries sector equalled approximately 80 percent of the island's GDP. It currently employs close to 1 100 registered fishers who operate almost 700 registered fishing boats (including bumboats, pirogues, and multipurpose vessels) out of ten fish landing centres (Potts, 2002e).

Coastal areas are also important to the island's tourism industry. Diving and snorkelling over the coral reefs are popular activities – this is exemplified by an increase in both the number of divers and dive shops on the island in recent years (Potts and Sandy, 2001). Jetskiing, swimming, glass bottom boat tours of the coral reefs (particularly those found within the Buccoo Reef Marine Park and the Speyside area) are enjoyed by locals and visitors. Moreover, hotels, guesthouses, and restaurants have taken advantage of Tobago's reputation as an island with beautiful beaches and have often established themselves in close proximity to the coast. Conch, lobster, and fish are also caught locally and sold to restaurants. Craft shops often sell souvenirs either made out of or inspired by reef organisms (including corals).

Beachfront development, especially on the more tourist-oriented southwest region of the island, is substantial (Appendix 3.4). While access to beaches in Tobago is supposed to be free and public, beachfront hotels and beach clubs continue to push the legal limit of what they deem to be private property by controlling all access. Moreover, hotel owners and managers have argued that fish landing facilities are often located on popular tourist beaches and that the smell and sight of the fish bother the tourists. Of course, these same hotels and restaurants also buy this fish to serve to their guests and patrons.

Both the fishery and tourist industries depend on the health of the coastal and marine environments. The importance and need for access to (and at times, the perceived need for control over) these areas by stakeholders of the two industries has led not only to competition, but also conflict. Should this conflict not be addressed and properly dealt with, the two industries may not only be adversely

affected, but the very environment on which they depend may also be damaged. Government bodies have attempted to work with stakeholders in an effort to come to an agreement on how the marine and coastal environments can be used by all stakeholders in a peaceful and sustainable manner. Indeed, efforts by the Government of Trinidad and Tobago, and in particular, the Tobago House of Assembly (THA), have been directed at managing stakeholder conflict, coastal and marine resource and area use, and environmental conservation efforts. An example of such an attempt was the creation of the Buccoo Reef Marine Park.

Setting the Stage: Buccoo Reef Marine Park

The Buccoo Reef Complex

Buccoo Reef is a reef system that has been developing over the past 10 000 years. It covers approximately 12 hectares and extends west from Buccoo Bay to Pigeon Point. The reef complex consists of an arc of five reef flats, namely (from east to west) the Eastern Reef, Outer Reef, Northern Reef, Western Reef, and Pigeon Point Reef (Appendix 1.2). Channels of different depths divide these five reefs. Coral communities that have been identified in the reef complex include star, brain, and fire coral in addition to seafans. Other octocorals² and calcareous green algae can also be found in the area. The forereef slopes to approximately 30 metres in depth and the benthic coral communities are characterised primarily by large scleractinian colonies. Elkhorn coral has been identified in the shallower portions of the forereef (in areas between two and six metres in depth) while brain, starlet, and star coral are the predominant coral formations in the deeper forereef areas (IMA, 1995). In 1991, 70 species of fish were identified and these included, *inter alia*, blue tang, butterflyfish, grunts, wrasses, angelfish, and parrotfish (Laydoo, 1991).

The Buccoo Reef Marine Park and its Management Plan

The Central Government of Trinidad and Tobago established the BRMP in 1973 under the Marine Areas (Restricted Area) Order and the 1970 Marine Areas (Preservation and Enhancement) Act No. 1. Located on the southwest tip on the Caribbean Ocean side of the small island, the Park's primary function is to protect the coral reefs, seagrass beds, mangrove forests, and other sensitive coastal areas and organisms that are located at the land-water interface within the Park's boundaries (Appendix 1.3). The area is also multipurpose in the sense that it caters to the needs and activities of local and tourist fishers (commercial, subsistence, and recreational), reef tour operators, watersports operators, dive operators, divers, watersports enthusiasts, swimmers, snorkellers, and sunbathers.

The BRMP currently falls under the auspices of the Department of Marine Resources and Fisheries, THA and it is protected against a variety of anthropogenic impacts, assaults, and development initiatives under the aforementioned Act. Indeed, according to the Regulations,

Except with written permission of the Minister, or person duly authorized by him in writing to give such permission, no person shall:

1. go in or alight in a restricted area;
2. operate a boat or other vessel within a restricted area or cause or allow a boat or other vessel to enter such an area;
3. take or remove any fish (which includes coral, crabs, lobsters, shrimp, turtles, turtle eggs) and any species of marine fauna or bird from the restricted area;
4. take or remove any mangrove from a restricted area; and
5. dig, dredge, or otherwise interfere with the seabed of a restricted area (Republic of Trinidad and Tobago, 1970).

Although these protective measures were enacted in the early 1970s, a comprehensive management plan was not written until 1995 (Institute of Marine Affairs, 1995). The Institute of Marine Affairs (IMA), in their Executive Summary to the management plan (1995, i) states that the objectives of the BRMP management are four-fold. That is, the purpose of the Park's management is to:

1. protect and maintain the quality of the Buccoo Reef environment, particularly with respect to its ecology and water quality;
2. ensure that the users of Buccoo Reef Marine Park exploit this natural resource in a sustainable manner;
3. provide for the proper management of the proposed Marine Park through appropriate legal and institutional framework;³ and
4. provide information to the general public necessary for their understanding and appreciation of coral reefs as a natural resource, and their role in facilitating effective resource management.

The Institute (1995, 3) maintains that this management plan is a "scientifically-based method" for establishing a sustainable use regime for the Buccoo Reef Marine Park. The management plan, which took 18 months to develop, is the final result of five research studies.⁴

Within the management plan for the BRMP, the IMA (1995) made a series of recommendations that ranged from issues of access, surveillance and enforcement, permitted uses and users, zonation, safety requirements and equipment, public education and awareness, development control, pollution control, and management structure.⁵ In essence, the IMA (1995) suggested, in part:

1. increased and more stringent regulations on permitted and prohibited activities within Park boundaries (Appendix 3.6);
2. open access to all *bona fide* reef tour operators and clients in possession of a valid permit;
3. reef patrols should be conducted by uniformed officers during peak times for reef tours;
4. any activity that takes place within the BRMP boundaries should be in compliance with Park objectives and regulations – any activity that has negative environmental or socio-economic impacts on the reef and/or the surrounding area should be prohibited;
5. an annual user fee for reef tour operators should be instituted;
6. business persons operating within the Marine Park should be charged a user fee;
7. crafts made from marine organisms should not be sold/permitted within Park boundaries;
8. spear-fishing should be prohibited;

9. jetskiing should be prohibited;
10. disposal of fish-processing waste into the Marine Park should be prohibited;
11. fishing within Park boundaries should be prohibited;
12. land-based fisheries activities should be separated from tourism-related activities;
13. the BRMP should be zoned so that conflicting activities (for example boating and swimming) can be separated;
14. reef walking should be prohibited;
15. all reef tour boats must be equipped with proper safety equipment and boats must be powered according to vessel specifications;
16. an interpretive centre should be established at Buccoo Bay;
17. coastal development that is contrary to the proper and effective management of the BRMP should not be permitted;
18. sewage treatment facilities must be properly established and maintained;
19. a public education campaign based on the dissemination of written information, lectures, signs, and formal and informal linkages between the BRMP and users should be established and maintained;
20. continued environmental and socio-economic monitoring should be instituted; and
21. an advisory body composed of governmental and nongovernmental stakeholders should be created to inform the BRMP Manager.

While the recommendations, in themselves, are important since they reflect an understanding that the management of the BRMP prior to 1995 was lacking, they are somewhat superficial; they are recommendations without any specific plan of action. Moreover, for those recommendations that call for the prohibition of an activity, the IMA does not provide possible alternatives and this, in itself, is a concern. Thus, despite the establishment of the Marine Park, the creation of a Management Plan, and the IMA's management recommendations, there has still been a noticeable decline in the health of the BRMP's coastal ecosystems.

Tobago is a small island whose economy has become increasingly dependent upon the tourism industry. Indeed, coastal development on the southwest part of the island has focused on meeting the needs of tourists. For example, within this small area, there has been concentrated construction of hotels, guesthouses, restaurants, and night clubs. Unfortunately, increased development has led to further coastal erosion, grey water runoff, and habitat destruction; the BRMP is not immune to such negative impacts.

The fragile nature of the coral reefs, seagrass beds, and mangrove forests has made the area particularly sensitive to development initiatives – coral bleaching, sand erosion, decline in water quality, increased algal growth and coverage, and coral destruction have led to a decrease in the quality and aesthetic appeal of the environment. Illegal fishing, removal of coral and other marine organisms, and illegal mooring of boats regularly occur within the Park's perimeter. Confusion over ownership of and

responsibility for mangrove forests that line the terrestrial side of the Park has led to questions over jurisdiction. The fact that very little land has been included within its boundaries has limited the Department of Marine Resources and Fisheries⁶ ability to control land-based activities that adversely affect the marine and coastal environments of the Buccoo Reef Marine Park. In addition to constraints on Tobago's already limited financial resources, the relatively low status of the Marine Park on the THA's list of priorities, and a lack of Departmental personnel (including a Marine Park Manager), there has not been adequate implementation and enforcement of BRMP laws, regulations, and management plan recommendations. In this sense, the BRMP has not achieved its objectives.

As stated in the previous chapter, it is widely recognised that the most successful MPAs are those that consult with and encourage the support and involvement of Park users (that is, the stakeholders) during the planning and management processes (Agardy, 1993; Dixon, Scura, and van't Hof, 1993; Ham and Meganck, 1993; Krausse, 1995; McNeely, 1992; Shafer, 1999). Moreover, as Agardy (1994, 269) notes, MPAs are public spaces that "allow users to become actively involved in planning (rather than being the recipient of management regimes imposed from outside) and in management – including undertaking enforcement regulations – through partnerships between regulatory agencies and user groups." Furthermore, "MPAs provide a means to empower local stakeholders and raise the profile of their coastal conservation needs" (Agardy, 1994, 269) by giving a voice to those who are dependent upon the actual MPA and its surrounding area. Agardy (1994) is thus advocating the need for co-management of MPAs. Similarly, Krausse (1995) maintains that public involvement in conservation measures may include gathering information for government-sponsored projects, interacting with managers and discussing project design and implementation procedures, assisting in the decision-making processes, initiating action for community development, and/or becoming more environmentally aware and educated.

The potential for more effective management of the BRMP has not been lost upon the Department. Indeed, the success of such a management programme in Bonair e (Bonaire Marine Park) and St. Lucia (Soufriere Marine Management Area)⁷ have buoyed and increased support for co-management (or at least increased community participation) among both government and community bodies and representatives. In light of the surrounding communities' (primarily Bon Accord and Buccoo Village) concerns, in recognition that governmental conservation methods could be improved, and a willingness to try something new, a collaborative research project among the THA, the University of East Anglia, and the University of the West Indies, St. Augustine, began in 1998.

The initial project, entitled "The Potential Role of Trade-off Analysis in Natural Resource Management in Trinidad and Tobago," involved, in part, researchers helping to organise community members who were interested in and concerned about the declining health of the Park and to discuss the possibility of forming a community group. The group would actively pursue projects that would promote ecosystem health and community environmental awareness. The group, Buccoo Reef Action Group (BRAG), that ultimately formed in March 1999, was comprised of RTOs, fisherfolk, DOs, watersports

operators, nongovernmental organisation (NGO) representatives, Village Council representatives, government representatives, and other concerned community members primarily from the areas surrounding the Park. In essence, the stakeholders who were involved with the project were both primary and secondary stakeholders – those who were considered important but who lacked influence at higher decision-making levels, as well as government representatives. Thus, external stakeholders, such as large landowners, hoteliers, and corporations who also had a stake in the Marine Park but who had both influence and certain amount of power were not approached to join the initial group or to take part in a consensus oriented workshop that was held as a component of the project (Young, 2002, pers. comm.).

Another project, "Building Consensus Amongst Stakeholders at the Land-Water Interface," was initiated in October 1999 to build upon the 1998 research effort. Again, it was a collaborative initiative among the THA, the UEA, and UWI. The 1999 research project was relatively diverse in its objectives:

1. to undertake a literature review of approaches to management of marine protected areas in the Caribbean region and interview key informants in Trinidad and Tobago;
2. to support and facilitate BRAG and act as a key liaison team between the project, the Department of Marine Resources and Fisheries, and the THA;
3. to undertake a review of relevant legislation and regulations of the THA and the Central Government of Trinidad and Tobago to identify constraints on the implementation of co-management of natural resources;
4. to assist in organising and facilitating a workshop on "Trade-off Analysis" in Tobago in October 1999;
5. to contribute to writing a manual on "Trade-off Analysis" and project reports;
6. to assist in organising a regional workshop concerning the co-management of Caribbean MPAs in January 2001; and
7. to conduct water quality sampling and analysis of the Buccoo Reef Marine Park (Tompkins *et. al.*, 2000).

While the project's goals were far-ranging, part of the project was community-oriented and involved the facilitation of the BRAG meetings.

Buccoo Reef Action Group: community participation and marine protected area management

The Formation of the Buccoo Reef Action Group

Part of the research project, which spanned from October 1999 to August 2000, focused on whether community members and other BRMP stakeholders showed an interest in coming together and pushing for increased responsibility for decision-making and management of the area. That is, a research team from the UEA worked with the Department of Marine Resources and Fisheries to conduct surveys of individuals and groups to help determine who were potential stakeholders. The identified stakeholders

were then asked whether they were interested in playing an active role in the management of the BRMP. Those who indicated such an interest were re-contacted. With the help of two facilitators, hired jointly by the UEA and the THA, individuals came together and formed the Buccoo Reef Action Group.⁸

As a community-based organisation, BRAG sought to develop and implement projects related to the conservation and preservation of the Buccoo Reef in a collaborative effort with the Department of Marine Resources and Fisheries. Their mandate clearly identifies such an objective: "Buccoo Reef Action Group seeks to preserve and conserve the Buccoo Reef through co-management, while educating the public about the reef, its ecosystem, and its watershed" (Young, Sandy, and Mukhida, 1999, 2). Thus, the essence of BRAG centred on the issue of public involvement in the decision-making and implementation processes concerning the BRMP.

The co-management approach seeks to address differing local interests and to empower the holders of those interests. Indeed, Venema and van den Breemer (1999,9) state that the "co-management approach is based on the principles of identifying the interests, rights and problems of all social categories with regards to certain natural resources, making these public to all parties and starting a public debate to arrive at a general agreement or legal contract among the parties, enforceable by the state on request." The ability to manage varying interests, while it is important to any co-management initiative, does not ensure continued collaboration. Trust, openness, communication, belief in the cause, as well as personal and group gain are all critical components of this approach.

During the initial meeting held in March 1999, the group of over 20 stakeholders decided on projects that should be further researched and implemented. These activities included:

1. placing permanent moorings within the BRMP for boats belonging to fishers, dive operators, and yachts;
2. implementing an education programme on how to anchor boats properly;
3. firmly establishing BRAG;
4. stopping reef walking within the BRMP;
5. limiting the disposal of sewage/waste and pollution into the BRMP;
6. posting signs within the Park outlining the legislation that protects the area;
7. arranging a school competition for the creation of a Park logo;
8. educating Tobagonians about possible water conservation practices; and
9. creating a watchdog programme, based on volunteers, for the BRMP (Tompkins *et. al.*, 1999).

The activities that the members wished to pursue reflected the various interests of those involved as well as a number of the IMA's recommendations that were submitted in the BRMP management plan.

During the monthly meetings that were held throughout the duration of the project period, the number of initiatives were reduced (through a voting process) from nine to four:

1. the placement of mooring buoys within the BRMP;
2. the creation and dissemination of brochures concerning anthropogenic impact on coral reefs and their associated ecosystems, and in particular, those within the BRMP;

3. the mounting of signs that are both legislative and informative in nature on several beaches around Tobago (namely, Store Bay, Pigeon Point, Buccoo Bay, and Mt. Irvine Bay); and
4. the stopping of reef walking (Young, Sandy, and Mukhida, 1999).

The latter project was ultimately abandoned when reef tour operators “vehemently opposed” (Sandy, 2001, pers. comm.) it.

Reef tours on the Buccoo Reef complex have been conducted for decades. Indeed, the trade began in the 1930s when small boats, launched from Buccoo Bay, took visitors around the reef (IMA, 1995). These boats were eventually replaced by those with (or were fitted with) glass panels so that visitors could view the coral reef ecosystem from within the confines of the boats. From the Marine Park management perspective, this was to both protect the visitors from injuring themselves on the rocky bottom and to protect the fragile coral structures from being destroyed by people trampling on them. Not allowing people to step on the reef, however, was not legislated and during the early 1980s, RTOs recognised the opportunity to allow visitors to “reef walk.” Shoes, masks, and snorkels were provided and visitors began walking on the reef (Appendix 3.7).

As concern about the impact of such activities grew, community members, dive operators, government officials, and even tourists have voiced their concern for and opposition against continued reef walking. RTOs, however, maintain that reef walking is part of the “reef experience.” Stopping reef walking, they believe, would detrimentally affect their business. That is not to say that RTOs have not been (or are currently not) concerned about the environmental quality and integrity of Buccoo Reef – they are. They did suggest though, that reef walking was not the leading cause to the destruction of the coral communities (and the decline in the general health) of the Marine Park. Rather, they firmly believe that sewage and grey water runoff was the leading and most damaging factor.

Regardless, by August 2000 (and after eight stakeholder meetings), the THA -UEA -UWI research project came to an end. Although one of the goals of the project was to help establish a CBO that was interested in more actively participating in managing the BRMP, the end of the project also saw the disbanding of BRAG prior to the completion of any of its initiatives.⁹ Sandy (2001, pers. comm.) believes that the potential for the projects to be implemented still exists. It would, however, become solely a government responsibility to ensure that this is done – unless BRAG (or some other organisation with a similar mandate and interests) was to become once again active. Without public pressure, however, to implement the projects it may take longer. Sandy (2001, pers. comm.) maintains that the projects “will ultimately get done, but instead of three months or so, they may take six months to complete.” Indeed, the Department recently received funding from the THA to install the signs that BRAG had initially developed (approximately two years earlier). In general, the initiatives that BRAG undertook (or at least wished to undertake) were extensive, expensive, time-consuming, and could not be implemented in a short amount of time. Such factors, in addition to a number of other constraints, not only affected BRAG’s ability to implement the projects that it wished to pursue, but also the very survival of the Group as a community-based organisation.

Understanding the Purpose of the Buccoo Reef Action Group and the Importance of Communication

While over 20 stakeholders attended the initial March 1999 meeting, only five or six attended the subsequent monthly meetings. Even within this small group and despite the creation of a widely accepted and determined mandate, different ideas of why BRAG was created existed. Of the core stakeholder group, there was a general understanding that the Group would work in conjunction with the THA to implement projects that would lead to the conservation and preservation of the Buccoo Reef Marine Park. Indeed, Akili (2002, pers. comm.), the former Director of the environmental NGO, Environment TOBAGO, and BRAG member, suggests that the reason for establishing the Group was “to effect and impose management improvement of the Buccoo Reef area and complex in a situation where there have been numerous studies.” Moreover, it was “to allow communities in Bon Accord and Buccoo to participate effectively in management” (Akili, 2002, pers. comm.). In essence, Akili (2002, pers. comm.) maintains that “BRAG was an attempt to involve the community directly in the decision-making process.” This idea was supported by other Group members including Trim (2002, pers. comm.) and Pollard (2002, pers. comm.), representatives of Bon Accord Village Council and Buccoo Village Council, respectively.

At the same time, Young, one of the two principal facilitators, maintains that the purpose of the Group (regardless of its mandate) was not co-management and that the Group itself was not a co-management arrangement. Rather, BRAG emerged out of a research project whose own aim was “to develop a management tool for managers to use in areas of conflict” (Young, 2002, pers. comm.) – that is, in areas where there are conflicting uses. Buccoo Reef Marine Park was used as a case study and the project was to examine the optimal management methods – and that may not have necessarily been co-management.

The first project (which took place between 1998 and 1999) had determined the conflicts of the area, the interests and positions of the stakeholders, and the future roles that those stakeholders were willing to assume. According to Young (2002, pers. comm.), BRAG emerged out of this process since BRAG members were, for the most part, involved with the first project. The second project, which lasted from October 1999 to August 2000, was a continuation of the first in the sense that the UEA research group (with the help of Shim¹⁰) realised that community members were in fact willing to continue the process. The research team believed that although they had completed their own project, they did have some responsibility to the community and the process that they had helped to stimulate. Young (2002, pers. comm.) suggests that BRAG was a project-driven CBO comprised of “concerned citizens or stakeholders who wanted to come together – it [was] questionable whether they actually meant for co-management.” Sandy, the second principal facilitator, however, was under the impression that co-management, or at least a significant effort towards greater public participation in the management of the Buccoo Reef Marine Park, was an inherent part of the project (Sandy, 2002a, pers. comm.).

This is not a small discrepancy. Indeed, it raises questions of how seriously the mandate (as determined by the Group) was taken by the UEA research team, and the communication that took place between the project's collaborators and the community members. Open dialogue, one of the key components to any successful multi-interest organisation appears to have been missing at the crucial first stages of the Group's formation. While this may have reflected the different parties' assumptions of each other's expectations, it may more likely have to do with a relatively poor relationship between the UEA and the THA and the fact that the establishment of BRAG was considered only a small part of a larger internationally-funded project.

The relationship between the UEA project leaders and the Department of Marine Resources and Fisheries (and particularly with the Director of the Department) was tense. During the initial 1998-1999 project, the UEA team had been working with Shim and Caesar.¹¹ By the beginning of the second project – and indeed, the discussions leading to the project's implementation – a change in Department Directors (to Potts) led to a change in group dynamics. In this case, "group" refers to members of the UEA research team, the Department, and UWI representatives. In what Sandy (2002c pers. com) terms "perceived wrongs," there appears to be a cycle of misunderstanding, action, and then reaction from both sides. There is much concern in Tobago and in the Wider Caribbean, in general, that outside researchers come into the region, conduct their research, collect data and information, and then leave without providing anything substantial for the host country or institution. This is compounded by difficulties in accessing raw and analysed data and, at times, having to pay for it (Potts, 2002a). The UEA researchers decided to continue the joint project into a second year and "to help stakeholders to continue to meet" (Young, 2002, pers. comm.) by providing a facilitator (Young) and a limited amount of funding (to be accessed by the stakeholder group). Past experiences and mistrust, however, led Potts to be hesitant in fully accepting the UEA researchers and a joint project that they had, for the most part, developed and initiated on their own.

With regards to BRAG, the collaborative project had hired a single facilitator, Young, who Potts considered to be affiliated primarily with the UEA and UWI – not the THA.¹² Potts pushed for a THA counterpart to be hired in order to have more direct and daily government representation. This counterpart, Sandy, was to be principally involved with BRAG and the part of the project that involved examining management options for the land-water interface.

A confrontational attitude, whether intentional or not, was adopted by both the UEA and THA representatives and this remained throughout the duration of the second project. In addition, the belief (held by the Director) that BRAG was a part of a results-oriented larger initiative may have diminished the importance of the Group and led to it not being taken as seriously as it perhaps should have been by both primary collaborators. The facilitators, meanwhile, were faced with the difficult task of being partisan representatives of the UEA and the THA while at the same time trying to maintain a certain amount of objectivity.

Resolving the Conflict Within

Despite a somewhat tumultuous behind-the-scene beginning, BRAG was eventually formed and, for most stakeholders that were involved with the Group, there was a general understanding that the Group's formation was one step towards co-management (as supported by the mandate that the Group ultimately adopted as their own). Apart from dealing with the varying interests and positions of the collaborating parties (that is, the THA, the UEA, and the UWI), those of the community members and stakeholders also had to be addressed. Fisher and Ury (1991, 41) define interests as "desires and concerns" that are often "intangible" and underlie positions and define the problem at hand. Positions, meanwhile, tend to be more concrete and are often defined by values and stances. Interests, Fisher and Ury (1991) maintain, are more likely to be reconciled than positions because more than one interest usually exists for each stakeholder and thus, the potential for some commonality to be found within those interests may be greater.

Within the context of BRAG, multiple stakeholders, with varying interests and positions, gathered and worked together to form a plan of action that would try to meet and recognise the needs of each individual party. This cohesion was accomplished only after the differences of the stakeholders were determined and worked through. That is, in March 1999, in a joint effort among the THA, the UEA, and the UWI, potential stakeholders were identified. This group met to discuss their positions, interests, and concerns regarding the current management practices and the future plans of the BRMP and Tobago's coastal resources, in general. Members from this initial group¹³ indicated an interest in continuing to meet as well as in this process of understanding and decision-making for group gain through consensus (Young, 2002, pers. comm.).

During the March 1999 meeting, the group of over 20 members decided on projects that should be further researched and implemented.¹⁴ The activities that the members wished to pursue reflected the various interests of those involved. The linkage that held all the activities, interests, and members together was a powerful recognition that the BRMP's ecological health was suffering for a variety of reasons and a belief that the community could play a role in actively preserving and protecting the environment if armed with the necessary knowledge and tools.

The potential for conflict was great. The different stakeholders involved in the March 1999 meeting came from diverse social, economic, and political backgrounds. All, however, were affected by the quality of the reef (or the lack thereof) either personally or in terms of their employment or business. Moreover, the actions and impact of some stakeholders on the Marine Park directly affected those of other stakeholders. A primary example of this is the position of the reef tour operators who maintained that reef walking was an integral part of visitors' trips on the reef and through the Marine Park. At the same time, this activity, while it may not be the leading cause of reef degradation does nevertheless impact the aesthetics (not to mention the environmental integrity) of the area. It should be noted that two reef tour operators have recently stopped offering shoes to visitors (Nero, 2002, pers. comm.). While it does not completely prevent people from reef walking, it has deterred some. Both the economic and

environmental impacts of this measure should be assessed – although it could safely be assumed that environmentally, the impact of reef walking remains since the other reef tour captains and operators continue to support the practice.¹⁵

A team from the UEA and THA facilitated the March 1999 meeting. The team sought to establish an atmosphere of understanding. Indeed, this meeting established the foundation on which future meetings would be based. That is, the potential for and success of future meetings depended upon the success of the one held in March 1999. By agreeing to issues and projects that all stakeholders accepted, trust and openness were cultivated among the members. The importance of this is supported by Paulson (1998, 307) who states that the “elimination of unnecessary conflict and mistrust is an important first step toward enabling groups to address and work with their real differences.” In order to effectively manage common and conflicting interests, there must also be a balance between stakeholders creating and claiming value. Lax and Sebenius (1986, 31) explain that value creators believe in open and “honest communication” and in “inventing solutions.” Also inherent to creating value is recognition that “one’s gains need not be another’s loss” (Lax and Sebenius 1986, 32). Meanwhile, “value claimers tend to see this drive for joint gain as naïve and weak-minded” (Lax and Sebenius, 1986, 32); claiming value is adversarial in nature. In essence, value creators maintain that a win-win solution is possible, while value claimers tend to see conflict positions as win-lose situations. Neither of these approaches is complete. A natural tension exists in most situations such that there must be both a creation of value through co-operation and a claiming of value through competition. That is, “the process of creating value is *entwined* with the process of claiming it” (Lax and Sebenius, 1986, 44). Within a multi-party situation, while joint gains are possible, it requires each party understanding their interests. Once each party’s interests have been established, the possibility of joint gains can be considered.

Value is created by “harmonizing” interests and “set[ting] forth different ways that interests can be converted” (Lax and Sebenius, 1986, 42) into gains or a form of action that is acceptable to all parties. Value is claimed when a party is able to take advantage of the joint gains and manipulate them to their benefit. This requires at least one party working against the others under the pretence of co-operation. In an ideal setting, a mutual gains/win-win situation would prevail. Parties, however, make decisions and take action according to what they believe is in their best interests. Agreements and plans of action that have been decided upon by multiple parties will involve both creating and claiming. The role of the facilitator is to help define manageable goals and objectives for the group as a whole, to help find the balance between creating and claiming value, and to ensure that all stakeholders are represented and their interests are heard.

With regards to the initial THA-UEA-UWI 1998-1999 project, the idea of creating and claiming value played an important role in determining the positions and compromises (social, economic, and ecological in nature) that the various BRMP users held and were willing to make (Brown, Tompkins, Adger, 2001). Furthermore, BRAG was able, for the most part, to build on this framework and work with the divergent positions, values, and interests of its stakeholders. At the same time, it should be noted that

not all stakeholders who were present at the initial meeting returned to the subsequent ones. Fisherfolk, reef tour operators, and dive operators attended irregularly – if at all. Thus, their views were often not represented (Potts, 2002b, pers. comm.). Moreover, only primary stakeholders were invited to the March 1999 meeting. Landowners, whose personal and professional decisions can have profound impacts on the BRMP (through, *inter alia*, land development, runoff, and erosion), were considered external stakeholders and thus were not invited to the meeting. Akili (2002, pers. comm.) maintains that this was a serious error on the part of the research team, especially when considering the amount of coastal land that is owned by large, corporate developers. At the same time, the position that the team members adopted with regards to whom should be initially approached to take part in the meeting is understandable. The members believed that landowners were already influential in island (and state) politics and could therefore have a disproportionate amount of power and control over the direction of group discussion and decisions. It should also be noted that Environment TOBAGO was also not invited to the initial meeting and only joined the Group in November 1999 after the NGO submitted a request (Tompkins *et al.*, 1999).

Collaborating and finding the balance between creating and claiming value is not easy – it is a dynamic process that needs constant re-evaluation. In order to ensure that the Group would continue to meet, common interests needed to be established. From this, what each stakeholder gained or received would follow. Openness, communication, belief in the cause, and regular monthly meetings helped to create a form of routine and constancy for BRAG – even if it was only for the extent of the THA-UEA-UWI project. That is, it helped to lay the foundation for the *establishment* of the Group. Gray (1989, 58) explains that the basis of collaboration lies in increasing stakeholders' "awareness of the forces that join them and their collective ability to manage these forces." BRAG's members recognised the need to protect the BRMP from further degradation and this recognition formed the basis of the Group's mandate. At the same time, agreement on a mandate and awareness of a general desire to be more involved in management issues and concerns tend not to be enough to ensure continued collaboration. Gray (1989, 59) maintains that there are five inter-linking issues that stakeholders often consider when deciding whether to pursue a collaborative approach:

1. does the present situation fail to serve [the stakeholder's] interests?
2. will collaboration produce positive outcomes?
3. is it possible to reach a fair agreement?
4. is there parity among stakeholders?
5. will the other [stakeholders] agree to collaborate?

These concerns could be applied to BRAG's situation. Stakeholders who attended the initial March 1999 meeting were asked about their interests, their views on management, and their willingness to work with other stakeholders prior to the actual meeting. Those that decided to continue their involvement with the Group recognised that there was *potential* for success and collaboration. Whether or not this potential was transformed into action depended on the commitment and capabilities of those involved.

The Dynamics of Power: the parity of stakeholders

Tobago is a small island with a population approaching 60 000 (CIA, 2001). Communities are close in both the geographical and personal sense. Indeed, those working in the tourism and natural resource industries often encounter and work together on a daily, weekly, or at least, monthly basis. Thus, the group dynamics within BRAG was affected and shaped by the personal and work relationships that had already been formed and cultivated outside of the Group. These dynamics also influenced the distribution and assumption of power within BRAG.

Wondolleck, Manring, and Crowfoot (1996, 250) write that “citizens can now find themselves as an equal partner with...government, setting policies, establishing programs and making other decisions that affect the communities in which they live” and in the words of Akili (2002, pers. comm.), “why shouldn’t communities have a say?” Co-management and its call for public involvement in the decision-making process have the *potential* to change the power structure. The recognition of this change, however, is dependent upon the actions of those who control or have responsibility for the resources (in this case, the government) and the other stakeholders. While the Buccoo Reef Action Group was comprised of community members, it is important to remember that these members did not organise themselves. Researchers from the UEA approached the Director of the Department of Marine Resources and Fisheries in 1999. With the Department’s approval and co-operation, stakeholders were organised and supported (financially and through personnel) by the UEA. Helping to create a community-based organisation was not the primary goal of the 1999 March meeting – this emerged only after the UEA researchers decided to lend additional funds and a facilitator for another year. It is doubtful that BRAG would have convened without this catalyst.

This support and outside influence had profound implications on group dynamics and evolution. Sandy understood the effect that this had and states (2001, pers. comm.), “power was in the hands of the UEA team because they were the ones with the know-how” and the funds. At the same time, Sandy (2001, pers. comm.) maintains that the roles of the Department and the UEA (within the BRAG context) were that of facilitators. That is, through Young and Sandy’s help as facilitators, the Group would determine the agreed upon mandate as well as the projects that they wished to pursue in accordance with their mandate. Young and Sandy would provide technical support and would help to implement those projects. Sandy (2001, pers. comm.) believes that as time passed, the power dynamics would have shifted. Indeed, the facilitators had hoped that their roles would ebb as BRAG members became more confident in their abilities. Unfortunately, this did not occur.

After establishing interested parties and stakeholders in the March 1999 meeting, monthly meetings that were facilitated by the UEA-Department of Marine Resources and Fisheries team were held between November 1999 and August 2000.¹⁶ During the first four months of the Group’s existence, BRAG’s mandate was conceptualised and formalised. While the facilitators had requested members to consider and suggest possible statements that would concisely express the vision of the Group, the

mandate that was eventually agreed upon was the one formulated by the facilitators – the Group members had not made any other suggestions. The projects that the members wished to pursue were also finalised during this time period.

By conducting research on potential projects that would increase public participation in the management of the BRMP, the conservation of its resources, and public environmental awareness, it was soon discovered that many of the projects that the Group wished to pursue also coincided with those that the Department had also deemed important. Thus, an initiative that started as a venture to increase community involvement in coastal zone management became a close collaboration between the Group and the government in developing and implementing (or at least taking steps towards implementation of) conservation-based projects. That is, funding proposals that were written and submitted to various funding agencies, organisations, and private corporations were prepared as “Tobago House of Assembly-Buccoo Reef Action Group Joint Initiatives.” While this was seen as one way to limit competition for funding and to access funding directed towards government-nongovernmental co-operation, this collaboration changed the dynamics of the Group. The Department of Marine Resources and Fisheries was no longer a facilitator or consultant – it became an active member.

Prior to February 2000, Sandy was the only Department of Marine Resources and Fisheries representative and her official role was that of facilitator, not as a direct representative of the Department. Beginning in February, however, a second official from the Department began attending the monthly meetings. While most members of the Group recognised early on that the Department was a strong force that they had wanted to work with, at the same time, there was a sense, amongst some members, of frustration. This frustration stemmed from the belief that the Department had increased its power and now had the ability to veto their decisions (Sandy, 2001, pers. comm.). They believed that the Department was not an equal participant – the weight of its influence and power equalled that of all other members of BRAG. Since the projects were already decided upon and close collaboration was based upon the pursuit of these projects, the potential for co-option by the Department of the other community members was not as great as it otherwise could have been. Of course, this did not preclude it from happening in the future with other project initiatives.

Young (2002, pers. comm.) does voice the opinion, however, that the Department had tried to excessively direct the project and the Group. She provides the example of BRAG’s desire to mount signs explaining the BRMP’s legislation: the Department had requested that the signs include the THA logo as a watermark. Young (2002, pers. comm.) notes that a previous community-based organisation that had posted signs did so without the THA logo. At the same time, it should be remembered that the government was not a member of that organisation.¹⁷

The second Department of Marine Resources and Fisheries’ representative, Alexander, agrees with the concept of increased community involvement in the management of Tobago’s coastal resources. Of course, agreeing to an approach in theory is different from accepting it as practice. In this regard, Alexander (2002, pers. comm.) maintains that an NGO, CBO, or any other private

organisation/institution/body cannot take complete responsibility over the management of the island's natural resources without any government affiliation. Indeed, there must be some government involvement since it is the state that currently has legal responsibility over those resources (and areas) (Alexander, 2002, pers. comm.). Alexander (2002, pers. comm.) suggests that there should be a natural progression in the level of community involvement. This evolution should begin with a form of consultation that involves "going into communities and getting their perspectives." Stakeholders must "feel part-and-parcel of the plan and [this will make it] easier [for government] to manage the area and the user." In essence, "we need to strike a balance between us, as enforcers, and them, as users" (Alexander, 2002, pers. comm.). Regardless, if a collaborative approach to managing the BRMP is to be successful (or even possible), a careful re-examination of the role of the Department of Marine Resources and Fisheries within BRAG would have been necessary. This is important since, as Trim (2002, pers. comm.) states, BRAG "did not meet under the directives of the THA; the direction and issues were decided upon by the Group" – of which the THA was only one member.

Co-management, in itself, calls for governmental and nongovernmental participation in the management of areas and/or resources. If co-management of the BRMP is to be an effective option, government cannot undervalue stakeholder participation and stakeholders must not underestimate their own potential influence and role. It must also be remembered that the essence of co-management lies in its support for a bottom-up or horizontal approach to management, not the traditional top-down decision-making processes that are embedded in the structural solutions of policy, regulations, and legislation (Crance and Draper, 1996).

The perception of power can be as strong as the actual wielding of it. It was both the perception and reality of power and power imbalance that affected how BRAG developed over the ten-month period of the THA-UEA-UWI joint project. That is, the power dynamics within BRAG influenced the actions of the active members, the assignment and assumption of roles, who members sought advice and guidance from, and who assumed and accepted such responsibilities. While BRAG's official membership included over 25 people, a core group of six members regularly attended the monthly meetings and provided consistency, continuation, and direction for the Group.¹⁸ Such limited attendance greatly affected the distribution of responsibilities and the direction of discussion. This was particularly evident in the roles that Young and Sandy were, to a degree, forced to assume. They not only facilitated discussion at the meetings, but also developed each meeting's agenda, delivered reports and information concerning the meetings to the members, researched the projects that the Group decided to pursue, and helped to develop funding proposals; the line between facilitation and active membership was blurred.

When the Group was approached by Sandy and Young about individual members assuming more responsibility in order to ensure that BRAG could continue as a CBO after the completion of the THA-UEA-UWI initiative, members noted that they needed to be more active (Young, Sandy, and Mukhida, 2000b). While this recognition was voiced, it was not converted into action. Active members tended to be involved with other projects, initiatives, councils, and working groups in Tobago. They

remained interested in the cause, but their personal situations and lack of time often impeded them from dedicating the time and effort that was needed to sustain the Group.

The concept of power and parity among stakeholders in an organisation such as BRAG did play a role, to a certain extent, in the unfolding of group relations. It is important, however, to distinguish between power and control. The Group was established on the basis of common interests, collaboration, and trust. Members were sincere in their efforts to make the Group work. There was, however, tension between some individuals – primarily between the RTOs and the other members; between Bon Accord/Canaan and Buccoo representatives; and between the UEA researchers and Department of Marine Resources and Fisheries officials.

The issue separating most RTOs from other members of the Group centred on the practice of reef walking. The Group was eager to achieve concrete, tangible results and this initiative would have provided this. While it was resolved in the short-term by BRAG deciding not to pursue the issue, RTOs may have seen the Group as a threat and felt excluded from participating. Akili (2002, pers. comm.) remarks that “a reef tour operator would probably try to avoid participating in making any decisions and arriving at what we all know has to be effected at some time or another.” Putting himself in the place of an RTO, he further asks, “how do I return to my group and tell them that I have a participatory group that is trying to stop [what] we have been doing for so many years when [this Group has not provided] some clear alternatives in terms of maintaining revenue? I could understand their reluctance to participate.” While some RTOs/reef tour captains have indicated an interest in stopping reef walking (Nero, 2002, pers. comm.; Roachford, 2002, pers. comm.; Trim, 2002, pers. comm.), the lack of legislation against the activity is a concern.

Although some RTOs may stop offering the activity on their own tours, other RTOs may not and, in turn, use this “as leverage in convincing people to go out [on the reef] with them” (Nero, 2002, pers. comm.). Clearly, a comprehensive study should be conducted on the impact that not providing shoes/the reef walking opportunity to tourists has on the revenue generation and tourist traffic on the two operations that no longer offer them. Of course, there are other concerns as well, including: what will be done with the reef walking shoes; if the RTOs are to be compensated for the shoes, who will provide that compensation; whether user fees need to be introduced to help the government with the financial assistance that may ultimately be offered; and if a user fee is introduced, how this would affect the number of tourists visiting the reef (whether an increase in price would lead to a decrease in visitor traffic) (Akili, 2002, pers. comm.).

Introducing legislation to prohibit the activity has been discussed (and threatened) for a number of years. Without, however, financial resources to help the transition, in addition to a limited understanding of the real damage that the activity causes,¹⁹ a hesitancy to accept change, and a non-functioning Central Government²⁰ that could not effect change, reef walking has continued. At the same time, lack of *new* legislation should not be used as an excuse. Working with what already exists may be more effective. That is, current regulations, as previously mentioned, maintain that “no person shall...dig, dredge, or

otherwise interfere with the seabed of a restricted area” (Republic of Trinidad and Tobago, 1970). If coral reefs are considered part of the seabed, then reef walking should not be permitted since it technically “interferes” with it. The idea of co-management, however, does not advocate a complete top-down approach – enforcing “no reef walking” without addressing the concerns or working with the reef tour operators counters the essence of the approach. Legislation should guide the direction of change, but RTOs should be directly involved in the fine details and the process.

Tension between the Bon Accord/Canaan and Buccoo communities has been long-standing (Alexander, 2002, pers. comm.). Both Buccoo and Bon Accord communities have a stake in the BRMP – they both border the Marine Park and are consequently affected by management decisions regarding the environment and the economy (which is closely linked to the tourism industry). Again, some of the tension centres on the communities’ abilities to take economic advantage of the Marine Park and to attract tourists to the area. Although reef tour operations may have begun in Buccoo decades ago, most now operate out of Store Bay, located on the outskirts of Bon Accord (and just outside the borders of the Buccoo Reef Marine Park). While there are businesses that cater to tourists in Buccoo Village, most development has occurred in Bon Accord (and Crown Point – which is directly adjacent to Bon Accord). Plans for an interpretative centre, which will focus on the marine and coastal environments and the Buccoo Reef Marine Park, were designed during the mid-1990s. It was proposed that the facility be built in Buccoo Village. If that were the case, the issue of where reef tours would depart from would have to be addressed – it may make more sense to have all Park-related initiatives (including a management office) based out of Buccoo, rather than Store Bay (Appendix 3.8). Since this scenario is quite possible, it may have led to some hesitancy by both groups (that is, Bon Accord/Canaan and Buccoo Village Councils) to pursue projects and engage in any real discussion on issues that could have led to serious conflict and argument – although the tone seemed to be present.

As Alexander (2002, pers. comm.) notes, patience will be required and middle ground should be sought in order to ensure that these two communities can and will work effectively together towards the common goal of ensuring the health and integrity of the BRMP (and the coastal environment, in general). At the moment, there is not enough communication occurring between the two communities. A positive influence that BRAG had was that it created a forum where open and safe discussion could take place – dependent, of course, on whether community members were willing to talk. BRAG was still a new organisation and given the chance, these issues may have been seriously raised and addressed.

It should be noted that the Tobago House of Assembly is now considering a new planning design for the island. Within this plan, Tobago would be divided into five planning areas or districts. This may mean the merging of communities between Bon Accord (including Crown Point) to Buccoo to form one district.²¹ This may also entail the different Village Councils coming together to form a type of planning council. This council would provide and create an opportunity for concrete and constructive exchanges of ideas (Akili, 2002, pers. comm.). Akili (2002, pers. comm.) maintains that this community activism should be further reduced to the neighbourhood and street levels. That is, he believes that “people need to come

together to discuss their ideas and issues and then [meet] with other people from different parts of the community at the Village Council.”

The tension (and a certain amount of animosity and rivalry) that existed between the researchers from the UEA and officials within the Department of Marine Resources and Fisheries did not centre on BRAG specifically. Rather, the tension was primarily related to issues concerning funding, the implementation of research projects, and the expectations of the role of the facilitators and the project collaborators (particularly the UEA and the Department).

At the beginning of the joint research initiative, the Director of the Department believed that the role of the government and the Department was one of active participation within the Group itself. Members from the UEA research team viewed the Department as a resource-base and a facilitator for the Group. Tension was somewhat lessened when collaboration between the stakeholders and the Department was agreed to although this tension was never fully addressed.

Potts was never completely comfortable with the research project or convinced of the effectiveness (or potential for success) of the Group. This could be partly attributed to the fact that he viewed BRAG as part of a project – a project that was initiated, in part, to study possible management tools/processes (Potts, 2002d, pers. comm.). The fact that the study originated in England and not in Trinidad and Tobago or even in the Caribbean was also a concern. This situation was never entirely resolved and that did impede the efficiency of the Group and its project implementation capabilities – the legitimacy of BRAG was questioned from the outset.

Sandy (2002b, pers. comm.) and Akili (2002, pers. comm.) were also concerned with BRAG emerging out of a research project. In fact, Akili (2002, pers. comm.) goes so far to say that it was this that ultimately “led to its demise” – “as a community NGO, it was artificial. Its impetus came from a research project by people who wanted to experiment with certain approaches towards participation in natural resource management. Because of that, the leadership of the Group was basically the researchers.”²² Nevertheless, acceptance of the Group by the Department can be interpreted as a step towards accepting BRAG as a functional stakeholder group. Government participation and integration also helped, although it was important that government came into the Group as a member and not as a director or leader. Mohammed (2002, pers. comm.) explains this when he says that the “role of government is to implement laws, to help the Group implement projects, and to provide relief to problems.” At the same time, in order for government to be an effective stakeholder in such an organisation, state departments must be represented by officials who can make the necessary decisions and commitments.

The representatives of both the Department of Marine Resources and Fisheries and the Department of Public Health were not the Directors. This is not to say, however, that the participation of those government representatives in attendance was negligible or insignificant, only that it added another step in the already over-loaded and meeting-laden bureaucracy of government. The same could be said, although to a lesser degree, of the Village Council representation. In the case of the Department of Public

Health, Mohammed (2002, pers. comm.) notes that he was not supposed to represent the Department or the Division of Public Health at the BRAG meetings. He was asked to attend the November meeting in place of the Department's Director and following from that, the role defaulted onto him. While he created a file on the meetings' proceedings, he was not asked for or required to present a formal report.

Mohammed (2002, pers. comm.) allows, however, that the Group did not make any requests to the Department of Public Health and in that regard the Group wasted an important opportunity. Even though he was not the Director of the Department, he would have been able to push requests through the different levels of government. Indeed, Mohammed (2002, pers. comm.) states that more should have been demanded from the government – the Buccoo Reef Action Group should have “questioned, pressed, and lobbied” the government for action; “much more could have been done.”

Potts (2002a, pers. comm.) maintains that “marine resource management in Tobago has not been the best” – while the Department of Marine Resources and Fisheries “is responsible for managing the coastal and marine environments,” and while “it is the public sector [(meaning the state)] that spearheads management,...management should also include those who use the resources (legally and illegally).” In essence, these private sector stakeholders should be allowed, through “a well-organised mechanism” to “participate in a management structure that has been developed with their input.” Moreover, the needs of resource and area stakeholders must not only be taken into account, but their input must be sought early in the process. At the same time, the process itself must be flexible enough to allow for changes and amendments. Potts (2002a, pers. comm.) sees this mechanism as being a “comprehensive plan with sub-components” – in essence, a management plan. He maintains that it is important for “stakeholders [to] feel a true sense of ownership so that they can have a true sense of responsibility.”

While Potts may say and advocate this position, others (Peiser, 2002, pers. comm.; Pollard, 2002, pers. comm.; Trim, 2002, pers. comm.) question whether the stance that Potts describes is, in fact, what actually occurs. Peiser, (2002, pers. comm.) states that while collaboration is necessary, true collaboration never happens, primarily because “for the government, collaboration is equated with interference and there is a tendency to hold people back.” It should also be noted that representatives from two other environmental NGOs, Day (Buccoo Reef Trust) and de Baer (Tobago Marine Preservation Society, owner of World Wide Watersports, and supporter of PADI's [Professional Association of Diving Instructors] Project AWARE) both agree that Tobago's current Chief Secretary, Orville London, has been a strong and vocal proponent of environmental conservation and stakeholder collaboration/consultation (Day, 2002, pers. comm.; de Baer, 2002, pers. comm.). Whether what both Potts and London verbally promote is actually translated into action remains to be seen.

It is interesting to note that in discussions with Potts (2002a; 2002b), the Director stops short of proposing a high level of co-management. That is, the type of collaborative management that Potts supports reflects a more consultative rather than true collaborative approach. He states that “people need to make their comments and influence the proceedings, but government also needs to be able to count

on them” (Potts, 2002a, pers. comm.) for their support. According to his definition of co-management, he maintains that it is no longer an issue of whether co-management is possible, but rather when it will occur.

Co-Management and Consensus Decision-Making

One way to overcome any power imbalance (real or perceived) that may have existed within BRAG was through open communication and through a consensus-based approach to decision-making. “Building consensus by focusing on common needs or problems” (Strum, 1994, 514) is one way to resolve conflicts of interest. It calls for recognising and understanding the basic concerns of each party or stakeholder. Hare (1992, 37) maintains that the outcome of group decisions through consensus can take two forms: an agreement that incorporates the points of view of all the stakeholders or one that all of the stakeholders agree is best for the group at th[at] time.” Moreover, Hare (1992) suggests that the importance of consensus decision-making lies not only in the outcome, but also in the actual process that leads to a decision. He supports McGregor’s 1960 (c.f. Hare, 1992) description of effective group decision-making which McGregor outlines in 11 points:

1. there is a tendency for a relaxed, informal, and comfortable atmosphere;
2. there is much discussion with all (or almost all) members participating – discussion should remain (or always be brought back) to the issue at hand;
3. the task or objective of the group is understood and accepted by all members of the group;
4. while there is open discussion, members *listen* to one another;
5. there is disagreement and the group is comfortable with this – conflict is not avoided and disagreements are not suppressed; these disagreements must be dealt with, if not resolved;
6. decisions are reached through a form of consensus in which members agree to the decision and will comply with it; formal voting is kept to a minimum;
7. criticism is frequent, frank, and comfortable with it being constructive and not being personal attacks;
8. people may express their feelings and ideas on the issue as well as on the actual operation of the group;
9. when action is decided upon and taken, duties and assignments are clear and accepted by the group members;
10. the chairperson or facilitator of the group does not dominate – leadership will shift depending on the situation and there should be little power struggle within the group; and
11. the group remains aware of its own operation.

It should also be noted that the consensus-based approach to decision-making could be further broken down. That is, there are varying degrees of consensus. It can range from (in descending order of agreement):

1. full acceptance and endorsement of a decision by all parties within the Group;

2. endorsement with minor points of contention;
3. agreement but with revisions to the decision;
4. abstention;
5. standing aside;
6. formal disagreement but willing to accept the majority decision;
7. formal disagreement with a request to be absolved of responsibility for implementation; to
8. blocking both the decision and its implementation.

The Buccoo Reef Action Group adopted the consensus-based approach to decision-making. Moreover, the process described by McGregor (1960 c.f. Hare, 1992) closely reflected, with the exception of two points, the operations of the Group.

BRAG meetings were held either in a community centre or a school one evening every month beginning in November 1999. The meetings alternated between Bon Accord and Buccoo communities. While this may have helped to encourage participation and attendance of members from both communities, it also led to more people from the community in which the meeting was based attending, and very few from the other community. Moreover, it was found that the further from the BRMP that the meetings were held, the less chance that people who actually worked on the reefs (namely RTOs and fisherfolk) would attend (Young, 2002, pers. comm.). In addition, most members already knew each other or knew of each other and the actual meeting place was arranged such that people faced each other and/or were close enough to remain seated while speaking and still be heard and seen.

Members who came to the meetings were genuinely interested in and supported the Group's mandate. Most members participated in the discussions (Tompkins *et. al.*, 1999; Young and Mukhida, 2000; Young, Sandy, and Mukhida, 1999, 2000a; 2000b; 2000c; 2000d) and the facilitators tried to ensure that all members had an opportunity to express their views, concerns, and feelings. While the facilitators tried to keep the discussions directed at the issues at hand, they recognised that many of the issues were multi-faceted and multidimensional and that the members' comments would reflect that.

Agendas were prepared before the meetings by the facilitators and members were asked if they agreed to it and if they had other topics and/or issues that they also wanted to discuss. For the most part, there was open discussion and active listening during the meetings. Akili (2002, pers. comm.), however, notes that this was not always the case. He raises the example of one Group member who was relatively influential within the Buccoo community. Akili (2002, pers. comm.) states that as a representative who was older than most of the other members, her views tended to be based on more traditional understandings of governance and management and she openly voiced her opinions and concerns about the direction that the Group was taking. More patience could have been demonstrated by both the other members and facilitators when explaining and discussing the new issues and concepts that were being considered.

Conflict and disagreement were not avoided. Indeed, this was particularly evident when reef walking was discussed. RTOs opposed any move by other members of the Group to stop the activity. The

operators suggested that the effects of land-based sources of pollution and other such threats to the coastal environment first be addressed. Members noted the concern and it was agreed by all individuals that any work towards ending reef walking would be set aside for the time being. The Group recognised that RTO participation (though limited) and support of the Group (outside of the meetings and in the field) was important since they were one of the few stakeholders who spent most of their time actually within the Marine Park. BRAG members would not, however, abandon the project entirely. They decided that alternatives for the RTOs were necessary (for example, closed seasons, limited/zoned activity areas) and that they would discuss and explore the issue at a later date based on that premise.

Most stakeholders also realised that certain management practices that should have been in place, as recommended by the IMA, were not. They were in agreement with those recommendations (Sandy, 2001, pers. comm.). Disagreements tended not to focus on the actual projects that they wished to pursue, but rather on how much government involvement was necessary, how the projects would be implemented, and who would be responsible for their implementation. Decisions concerning these issues were reached through candid discussions.

Not all conflict and tension, however, were completely addressed and resolved. As previously mentioned, conflict and tension existed between the THA and the UEA project collaborators as well as between the Bon Accord and Buccoo Village Councils/communities (although to a lesser degree). Since the issues that were dividing the parties were so deeply ingrained and never adequately addressed, the underlying feelings – whether they were mistrust, cynicism, scepticism, or general dislike – remained and undermined the entire process. The fact that such feelings existed at the joint project level between the UEA and the THA put into question how seriously BRAG would be taken (and thus its legitimacy) as well as the Group's future.

Consensus was considered to be agreeing with the decisions made to the extent that the members either fully supported them or at least did not “block” or hinder their implementation. Awareness of future interaction between the stakeholders outside of the Group also positively affected their willingness to speak and collaborate. Formal voting was kept to a minimum. Indeed, it only occurred once, when the four projects that Group wanted to pursue were finalised. Discussion followed the voting process and all members were in accordance with the projects related to the installation of mooring buoys, the posting of signs, and the creation of informative brochures. The project regarding reef walking also received a majority vote (Young, Sandy, and Mukhida, 1999).

While achieving consensus is ideal, there was some recognition that as more difficult choices had to be made, consensus may not have always been possible and a majority vote may have been required (Akili, 2002, pers. comm.; Sandy, 2002a, pers. comm.; Trim, 2002, pers. comm.; Young, 2002, pers. comm.). Regardless, criticism and disagreement towards projects and implementation of those projects was accepted. New ideas and suggestions were also welcomed. The closeness of the communities also allowed for an atmosphere of comfort and people felt free to not only express their feelings, ideas, and reservations about the substantive issues, but also about the operations of the meetings and the Group.

For example, after BRAG became more established, Akili suggested that more frequent meetings be held and that working groups be formed such that each group would focus on one of the particular projects already agreed upon. Other members supported the motion, although there were concerns about time commitments. The issue was raised and the Group decided that it required further consideration and would be addressed at the following meeting (Young, Sandy, and Mukhida, 2000d). Unfortunately, this suggestion was only formally raised two months before the joint THA-UEA-UWI project was scheduled to end. A lack of clear direction of the Group and its projects greatly affected its sustainability.

In terms of decisions made, the responsibility for the implementation of those decisions often lay with the facilitators. Group members often maintained that while they were still interested in the projects, they did not have the time required to do the necessary networking and proposal development. Thus, it was the facilitators who made the contacts with funding organisations and corporations, marine park managers within the Caribbean, and conservation groups. This led to foreseeable problems: when the THA-UEA-UWI research project was scheduled to end in August 2000, Group members would not have the knowledge of what is required to develop and implement projects. In essence, BRAG was unsustainable.

While the facilitators did not wish to assume the roles of “leaders,” the position was often deferred onto them because they were perceived as knowledgeable and experienced (Mohammed, 2002, pers. comm.). The facilitators tried to distribute responsibility and duties – granted this was done much too late into the project – but members were reluctant to accept too much. They feared that they would not be able to complete what was required for a multiple of reasons, not the least of which were time constraints, other personal obligations, and feeling that they were not qualified (Mohammed, 2002, pers. comm.). Pollard (2002, pers. comm.), looking back on how the events unfolded, believes that Group members should have been “put on the spot” and forced to assume responsibility and a leadership role. While both Pollard (2002, pers. comm.) and Young (2002, pers. comm.) agree that BRAG members may have wanted to be led, the fact that the facilitators were present and acting in that capacity for a fixed amount of time did not make this approach a long-term option. Moreover, community members cannot be forced to do anything; the Group was based on voluntary participation and desire must come from within.

Akili also often defaulted into the leadership position because of his experience as Director of Environment Tobago, his extensive knowledge of politics and the environment, as well as his contacts within the government. This occurred despite the fact that he had stated that his role within BRAG would have to be limited – this would help to ensure that BRAG would not automatically be equated with Environment TOBAGO and it would also help to limit potential conflicts of interest.

Finally, a power struggle did exist. This, however, was more of a reflection of the Department of Marine Resources and Fisheries’ need to feel in control of the actual implementation of the projects and not the Group itself. This was partly addressed by the collaboration and joint project proposals that were developed by BRAG and the Department. Both the stakeholders and the government acknowledged the importance of the consensus decision-making approach. The stakeholders realised that their actions

would be more influential if they were to work together to reach a common goal. Alienation of any particular stakeholder, party, or group would only hinder the process. Moreover, the Department of Marine Resources and Fisheries recognised that “the stakeholders were the ones who were ultimately affected by the decisions made...[T]hey were the ones who [had to be] happy with the decisions because they were the ones who had to live with them everyday” (Sandy, 2001, pers. comm.)

In terms of its role within BRAG, Sandy (2001, pers. comm.) believed that it would have been most appropriate for the Department to remain as an observer and/or facilitator and to “examine all of the possible impacts these decisions could have had on the environment and other communities” in the rest of Tobago, as well as Trinidad, and internationally. Indeed, while government involvement within the Group was welcomed, officials had to recognise that it was an initiative for the community (though it was not necessarily *community-based*) and the Department’s role should have principally been research- and support-oriented. Although somewhat contradictory to feelings that the Group was not entirely legitimate, the Department of Marine Resources and Fisheries still showed its acceptance of BRAG by respecting the decisions made by the members (to the surprise of some of the members and even the facilitators). Both BRAG and the Department actively and in good faith tried to raise funds for as well as implement the Group’s initiatives. Although the projects were large-scale and expensive, their importance and relevance justified both the Group’s (more so the facilitators’) and the Department’s efforts and financial expenditures. The process of consensus decision-making allowed for all stakeholders, including the Department of Marine Resources and Fisheries, to show an interest in exploring a different approach to the management of the BRMP. Furthermore, despite setbacks, conflicts, and scepticism, the fact that decisions and efforts to implement those decisions were made further attests to that.

The End of an Effort in Community Participation in Southwest Tobago

It is difficult to say whether it is theory that informs practice or if it is the practice that leads to the creation of theory. Regardless, in cases which involve communities, public participation, and the natural environment, the theory behind organisation, management, and conservation may not seem as important as to what is actually occurring on the ground. The Buccoo Reef Action Group emerged out of an internationally funded, collaborative initiative between the UEA, the THA, and the UWI. There are conflicting ideas of whether the Group could be described as “successful.” It was successful in terms of being able to bring different stakeholders together to discuss issues related to the BRMP. It was less successful in becoming a sustainable CBO, run for and by the community. Indeed, by the end of the THA-UEA-UWI project, BRAG had disbanded.

Problems related to BRAG existed from the outset – beginning with how it was established. While there was an interest in increased community participation in coastal zone management (and Marine Park management, in particular) that was voiced by BRMP stakeholders, it was unorganised. The larger project collaborators sought to bring some order and cohesiveness since it was recognised that these stakeholders may not have the capacity to do this on their own. Indeed, some community initiatives may

need this push from an outside source to act as a catalyst; this does not make them “artificial” (Akili, 2002, pers. comm.). In BRAG’s case, however, the outside influence was more than a push – it was sustaining the Group.

If a community group is to be established, especially if outsiders (that is, people from outside the community) create it, it must be ensured that a motivation to continue exists within the group and the community. The community expressed such an interest, and based on working with these interests, the UEA intentions and actions seemed fair and justified. At the same time, however, it must be remembered that it was part of a *research* project. Ownership over the Group and the process of formation was never completely accepted by the Group – partly because it was never entirely given to them.

The facilitators led the meetings and took the minutes. While certain information needed to be recorded for the research project, it undermined the role and the importance of the stakeholders. Some stakeholders already felt unqualified to accept more active and leadership-oriented roles. The fact that the facilitators (and researchers) did not give them a real opportunity to take that additional responsibility only helped to perpetuate such feelings of inadequacy.

As August 2000 approached, there was talk by both the facilitators and BRAG members of the need to disseminate and devolve responsibility from the facilitators to the rest of the Group. Unfortunately, by then it was too late. Capacity to allow for this transfer had not been developed. The lack of capacity, in part, emerged from the Group pushing for “less talk and more action” (Pollard, 2002, pers. comm.). Members wanted tangible results in a short amount of time. In order to achieve this during the allotted time frame of the larger project, important organisational steps were by-passed.

Regardless of whether co-management was an intended objective (of either the joint project collaborators or the stakeholders), what the Group was trying to accomplish by implementing their defined projects clearly indicate an increase in community involvement in marine park management. To this effect, in order to ensure that the projects could actually be implemented *by the Group*, the assistance that was provided to the stakeholders by the project leaders had to be both adequate and appropriate to the social, cultural, economic, political, and ecological contexts of the communities and their environment. Moreover, a clear *process* that would reflect the need for flexibility, malleability, and adaptability was essential. This approach would have to allow for some spontaneity, but within the chaos and the haphazardness of “learning by doing,” there must also be some form or type of system, structure, and design. That is, there must be a process that allows stakeholders to develop their own capabilities so that they may direct themselves and a desire for this must come from within the Group – it cannot be forced onto them. In essence, a balance between art and science and between leading and following was required and unfortunately, it was missing.

Summary

Co-management involves gathering people with different interests and positions together. The potential for conflict, dispute, and disagreement is great. In order to overcome them, the group must focus

on the interests that link the stakeholders together. In the case of the Buccoo Reef Action Group, the interests and commonality lay in increasing the community's role in protecting, preserving, and conserving the Buccoo Reef Marine Park. For the process to be legitimate, however, all stakeholders and their views (whether conflicting or supportive) need to be respected. The consensus decision-making process calls for open and free discussion and it is the role of the facilitators to ensure that this occurs.

Co-management is not easily accomplished. It involves communities working with government – an institution that is traditionally seen as the authoritative and dominant figure in most societies. In order for co-management to work, the top-down approach to decision-making needs to be shifted into one that is horizontal and bottom-up. Equality is paramount and a prerequisite to success. BRAG was based on this paradigm and it had the *potential* to be influential. Unfortunately, the Group was not sustained. Due to time constraints, a belief that others would ensure its continuation, reliance on the facilitators, and a lack in capacity all contributed to BRAG demise. While most of these issues could have been addressed while BRAG was active, they were not. This was an apparent mistake. Mistakes, however, can be learned from.

More effective Marine Park management is still required. With efforts to create a new Marine Park in Speyside, there are lessons to be learned from BRAG. The following chapter looks at the situation in Speyside and examines the possibility of implementing a more participatory and effective approach to MPA management.

Endnotes

¹ TT\$92.5 million is equivalent to approximately Cdn\$23.1 million.

² Octocorals are corals that contain eight tentacles that surround each coral polyp's mouth. Gorgonian corals – those with horny or calcareous central skeletons that tend to exist as tree-like colonies – are octocorals. Examples of such types of corals include seafans, sea feathers, and sea rods (Laydoo, 1991).

³ "Proposed" refers to the proposed extended boundaries of the BRMP (Appendix 3.5).

⁴ These studies were biological/ecological, water quality, socio-economic, public awareness, and legal/institutional assessments of the area.

⁵ The IMA (1995) provides details concerning individual recommendations.

⁶ The Department of Marine Resources and Fisheries, THA is the government department that is responsible for managing the Buccoo Reef Marine Park.

⁷ It should be noted that Soufriere Marine Management Area has recently experienced some management setbacks although they have been rectified for the most part.

⁸ My role within this Group stemmed from my internship position with the Department. I was considered a Departmental representative, but I primarily helped the facilitators with their responsibilities. That is, I helped them to organise meetings, disseminate information, design project and funding proposals, and network with experts in the field. When the facilitators are referred to within this paper, while I am primarily referring to the two official facilitators, I also (to a certain extent) should be included.

⁹ As a project output for the 1998-1999 initiative, Brown, Tompkins, and Adger (2001) published Trade-off Analysis for Participatory Coastal Zone Decision-Making. This document tried to balance the practical and

theoretical components of conflict resolution, multi-party coastal resources use, and management. The Buccoo Reef Marine Park was used as a case study.

¹⁰ David Shim was the BRMP Manager until mid-1999.

¹¹ Erol Caesar was Director of the Department at the time of the first joint THA-UEA-UWI project.

¹² The role of the University of the West Indies was to provide scientific support to the Group and to the larger project.

¹³ Members of this group included RTOs, DOs, watersports operators, fisherfolk, and representatives from various Village Councils, the surrounding community, as well as government departments.

¹⁴ Please refer to the section entitled "The Formation of the Buccoo Reef Action Group" for a list of the identified projects.

¹⁵ There are 20 reef boats (and 13 different owners) operating within the BRMP.

¹⁶ It was expected that after August 2000, BRAG members would hold regular meetings if interest to do so were expressed. These meetings would not fall under the joint project and the facilitators, if interested in remaining with the Group (and if the Group accepted them), would assume the roles of active members.

¹⁷ This organisation, the Crusoe Reef Society, was an environmental nongovernmental organisation (one of the first of its kind in Tobago) that was concerned with the health and integrity of the Buccoo Reef Marine Park.

¹⁸ These six members (not including the Department of Marine Resources and Fisheries representative) included three representatives from two different Village Councils (Bon Accord and Buccoo), one representative from Environment TOBAGO, one representative from the Department of Public Health, and one former RTO.

¹⁹ Many RTOs maintain that the activity takes place on already-damaged areas of the reef and they are therefore not contributing to further degradation. Restoration/rehabilitation of the area may be possible although small-scale studies should first be conducted to determine the viability of a more large-scale initiative. It should also be noted that the restoration of coral cover is compounded by land-based nutrient runoff into the Buccoo Reef complex from the surrounding communities.

²⁰ For most of 2002, The Central Government of Trinidad and Tobago was in a deadlock – there was equal representation by the two leading parties (the People's National Movement [PNM] and the National Alliance for Reconstruction) making the passing of laws and regulations very difficult. A recent election (held in October 2002) has given the PNM majority seats (that is, 20 of the 36 Parliamentary seats are held by the PNM). There is now hope that the end of the deadlock will result in improved policy and programme development/action.

²¹ Currently, Tobago is divided into large parishes that include towns and villages. Each village has a Village Council where issues pertaining to the community are discussed. While these Councils are formal organisations with presidents, secretaries, and treasurers, they do not have any real power outside of their own community. Moreover, there is no statutory requirement for Village Councils to be consulted by any governing body.

²² The issue of the facilitators' and researchers' roles within the Group will be discussed in greater detail in the section "Co-Management and Consensus Decision-Making."

Chapter Four: The Case of Speyside Reefs Marine Park: Potential for Co-management

“When you come down the hill and look down, you see paradise” – J. Davis, Secretary of the Speyside Village Council, on Speyside

Tobago’s Northeast: Speyside Reefs Area

Located on the northeast side of the small island of Tobago, Speyside (a village of close to 1100 people) borders some of Tobago’s most beautiful reefs. Indeed, an area of approximately 130 hectares, Speyside’s marine area encompasses eight fringing reefs: (from the north) Starwood Reef located in Starwood Bay (also called Anse Goulême); Belmont Reef in Belmont Bay (also called Anse Brisant); Bateau Reef in Blue Waters Bay (also called Anse Bateau); Lau’s Reef, Big Reef, and Lucy Vale Reef in the northern, central, and southern regions of Tyrrels Bay, respectively; Goat Island Reef on the leeward side of Goat Island; and Little Tobago Reef which lies to the west and south of Little Tobago Island (Appendix 1.4) (Laydoo, 1991).

With the reefs sloping to depths of 35 metres, the area’s fauna and flora are diverse. Laydoo (1991) states that approximately 44 coral species exist within the reef complex while an IMA (2001) study indicates that a total of 84 fish species inhabit the eight reefs. According to Laydoo (1991), the most prominent reef inhabitants include octocorals, stony corals, sponges, marine algae, and various reef fish (including, but not limited to, grunts, snappers, damselfish, and parrotfish). Numerous other reef invertebrates and plants can also be found in the area.

Shallow areas of the reef slopes have been chronically damaged by storms. These areas are characterised by the remnants of broken stoney corals, particularly elkhorn coral which have formed crevices and burrows that have subsequently provided ideal shelter for a myriad of reef organisms. Deeper areas of the reef slope are lined with sea fans, sea feathers, sea rods, and other octocorals. Sponges, sea urchins, brittle stars, basket stars, and molluscs are common, while lobsters and conchs are less so (IMA, 2001; Laydoo, 1991).

The diversity and abundance of reef fauna and flora, warm waters, and good visibility have helped to support a number of marine activities, namely, fishing, reef tours, snorkelling, and dive operations. Fishing is an essential part of the Speyside community. The IMA (2001, 2-16) notes that while there are only 25 registered fishermen in the area (two of whom are full time), almost the entire village is “involved in the activity at various levels.” Fishing methods include seine, banking, trolling (towing), pot fishing, and spear fishing (with and without scuba equipment). Commercial, subsistence, and recreational fishing are carried out, with the most popular fishing grounds being located near Little Tobago Island (in an area known as Picker) and around St. Giles Island.

There are no less than four reef tour operations based in Speyside (Appendix 4.1). While locals may visit the marine area on the glass-bottom boats, these tours tend to carry tourists. Frank (2002, pers.

comm.) notes that most reef tour operators in Speyside follow self-introduced and -enforced standards that oversee the quality and actual operations of the tours. Moreover, close association with the area's hotels has led many RTOs to abide by the standards also set by these hotels. Frank (2002, pers. comm.) further states that many operators/captains have tour guide experience (if not formal training) and because of this, the tours not only provide a glimpse of Speyside's underwater beauty, but they are also informative.

Speyside's clear waters have also supported a healthy dive industry. Laydoo (1991) observes that the first dive shop in the community was established at one of the village's hotels during the 1960s. While it was first managed by an American consortium, since the 1970s, it has been under local management. Recreational diving and snorkelling experiences are offered by both the six local dive shops as well as by those located in the southwest part of the island.

Tourism is an important income generator throughout Tobago. The northeast region of the island, however, is less developed and tends to cater to those tourists who are looking for a more quiet and "eco"-oriented vacation and atmosphere. The limited tourism sector-related development and the depths of the reefs have helped to minimise reef damage from tourism- and development-related impacts. At the same time, agricultural practices, deforestation and sewage and grey runoff from the towns that line the coast (as well as the squatter-occupied structures that have been built directly on the shoreline [Appendix 4.2]) and the watershed have affected the water quality and reef ecosystem integrity of the Speyside marine area. For example, the IMA (2001, 2-28) reports that while seawater quality is "generally good," nearshore areas are particularly "susceptible to water quality degradation due to the impact of land-based activities;" special mention is made of inadequate sewage disposal. Studies have supported these statements – land-based pollutants have negatively affected the water quality of the area between Blue Waters and Bishop's Bays – especially during the wet season. Regardless, the IMA (2001, 7-1) maintains that the "environmental quality of the Speyside Marine Area is still in good shape." The quality of the Speyside reef complex has led to government calls to proactively protect it through the creation of a marine protected area. Chapter Four examines the socio-economic and ecological issues behind the proposed Speyside Reefs Marine Park, its management plan, and the role that the community can play within it.

A Draft Management Plan for the Speyside Reefs Marine Park

Based on their findings regarding the quality, health, and integrity of the Speyside marine area, the IMA (2001) developed, as requested by the Tobago House of Assembly, a draft management plan. This plan suggests the short-term designation of a "managed area" that would eventually be replaced by a Marine Park. As a compilation of studies regarding land use, biological and ecological resources, physical oceanography, water and sediment quality, socio-economic conditions, public education and awareness, and legislative measures, the draft plan aims to be a comprehensive report that addresses the problems and opportunities that both the Speyside community and the reef complex face.

The plan, in this regard, assumes a proactive rather than reactive approach to management. This tone is established from the outset – the IMA (2001, i) states that the goal of Speyside reef area management is to “maintain and sustain a high level of ecological integrity of the Speyside Marine Area, whilst continuing human use of the area in a fashion that would not compromise the future needs of the area as a whole.” Management is to focus on (IMA, 2001, i):

1. protection and management;
2. restoration;
3. wise use;
4. education and awareness to acquire understanding and appreciation; and
5. enjoyment of the ecological and water quality characteristics of the reefs around Tobago as a basis for sustainable tourism.

The objectives of the proposed management programme reflect the larger management goal (IMA, 2001, i):

1. to manage the natural and physical resources efficiently and sustainably;
2. to balance development efforts and environmental conservation and thus sustainably utilize Speyside’s natural resources according to their assimilative and regenerative capacities;
3. to develop a multifaceted fund raising strategy with the aim of making the marine park self-financing;
4. to prevent and mitigate activities that impact negatively on the socio-economic, physical, and ecological integrity of the reefs area;
5. to increase public support and involvement, especially that of the local community, by demonstrating the tangible benefits of conservation and management; and
6. to incorporate a participatory decision making process for the implementation of management initiatives.

Six years after the creation of the Buccoo Reef Marine Park management plan, the IMA has had the opportunity to examine what has and has not worked in that area. Indeed, one of the greatest shortfalls of both the actual BRMP management plan and the THA’s determination of park boundaries was the lack of land inclusion. That is, the BRMP only included marine areas (including some mangrove forests) within its boundaries. After realising the difficulty of managing a purely marine environment without a terrestrial (and hence coastal) consideration, the proposed Speyside Reefs Marine Park seeks to be a truly integrated management effort – the watershed, towns, wetlands, rivers, forests, beaches, seagrass beds (although limited), and coral reefs have all been included within Park boundaries (Appendix 1.5 and Appendix 4.3). This integration (especially within the small island setting) is a recognition that, as Towle (c.f. Dahl, 1997, 33) states, “island coastal zones are circumferential (not linear as in continental states) and ‘analogous to a topological Moebius strip with no real inside and outside – the sea and the island are truly one identity...’”

In an area that falls between latitudes 11°17'N and 11°19'N and longitudes 60°30'W and 60°32'W, 11 735 hectares of marine environment and 12 735 hectares of land are to be protected and managed.¹ In an effort to determine the management issues that pertain to the proposed SRMP, the IMA conducted a SWOT analysis. This analysis examines the strengths, weaknesses, opportunities, and threats of the area. The IMA (2001, 4-1) also seeks, within this analysis and the draft plan, to determine the "potential for the area," the constraints that may impede achieving that potential, and possible plans of action that can aid in overcoming those constraints.

The strengths of the area include (IMA, 2001, 4-1):

1. the present environmental quality seems to be generally good, that is, according to user and community members, marine species are in good health;
2. low agricultural outflows;
3. users and wider community are knowledgeable in environmentally correct practices and willing to improve their knowledge;
4. wider community and specific users of the marine resources are willing to assist in protection; and
5. THA and central government seem willing and interested in improving and maintaining the environment in Speyside.

There are however, in addition to these strengths, a number of weaknesses that also need to be addressed (IMA, 2001, 4-2):

1. the lack of a sewage treatment plant is putting strain on the reef system, especially with increased coastal development;
2. there are early signs of watershed degradation;
3. the relationship between the Speyside community's day to day life and the impact on the reef system are not fully understood by the community;
4. there is a lack of an adequate enforcement mechanism;
5. authorities can be slow to act;
6. government can be very short-sighted and refuse to think strategically with the future in mind;
7. there has been an increase in marine contamination in the form of silt and coliform bacteria; and
8. marine species are being threatened by humans.

It is interesting to note the apparent contradiction that exists between the identified strengths and weaknesses of the area with particular reference to the level of environmental awareness and knowledge of the Speyside community. For example, the IMA (2001) suggests that the community is knowledgeable of environment-friendly practices, and yet at the same time, the Institute states that the community has not adequately linked the impact of its activities to the environment. Clearly both cannot be true, unless the IMA actually means that while the community is environmentally knowledgeable, this knowledge has not been translated into action. If the latter is the case, the support structure that not only encourages, but also allows for more environmentally-safe practices (for example, recycling, adequate garbage collection,

and institutional and financial support for alternative agricultural methods) must also be in place and critically examined.

The opportunities that the IMA identifies within the draft management plan must also be acknowledged. Indeed, the IMA (2001, 4-2) states that “management must be aware of these opportunities in order to adapt to change and make the most of opportunities as they are presented.” The management structure and regime, therefore, must be flexible in both their short- and long-term goals and processes. The IMA (2001, 4-2) lists six opportunities within the Speyside area:

1. an improvement in government commitment;
2. increased global and national environmental awareness;
3. the information age (access to and dissemination of information as well as links to new networks of contacts and experiences);
4. the potential for Speyside to gain in popularity;
5. increased (and new) economic benefits to the community; and
6. heavy future focus on environmental education in Speyside.

The opportunities are also matched with potential threats (IMA, 2001, 4-3):

1. failure in promoting compliance and enforcement;
2. lack of social cohesion;
3. lack of adequate financial resources;
4. activities harmful to the environment may prove difficult to curb; and
5. the possibility for oil and gas exploration to take place off the coast of Tobago.

These threats are matched by community reservations about the plans for the Marine Park. Indeed, concerns centre on why Speyside was chosen as a protected area site and the displacement and restriction of locals from carrying out traditional activities (such as fishing). There has also been a tendency to compare the proposed SRMP with the existing BRMP. This comparison, if anything, elucidates the community’s scepticism of marine parks and management plans – the BRMP’s management plan has only been minimally implemented and the state of the Buccoo Reef is poor. Indeed, the general belief and maintenance that the relatively healthy state of the Speyside reefs has led some members to question why protected area designation is required (Speyside Community Meeting, 2002).

The IMA (2001) has acknowledged these concerns in the draft management plan. The Institute has further recognised that for any management programme to be effective, the area must be self-financing which can be accomplished by implementing a system of permits and user fees (applied particularly to reef tour and dive operations), hotel taxes, and the creation of an endowment fund. Regular feedback through long-term monitoring and data analysis on sources and impacts of pollution on coral reef and associated ecosystems and on fishing practices (types, location, species caught, and the impact of spear-fishing) are also required. The IMA (2001) has also suggested that an interpretive centre for both visitors and the local community should also be established.

Other important elements that the IMA (2001, 7-1) maintains will help to ensure the success of the area and the implementation of the management plan include the following:

1. in order for any management initiative to succeed, government must place the environment high on the agenda – the full backing and commitment to implementation by the THA is necessary for the achievement of management goals;
2. community meetings and input are essential and the formulation and establishment of the Speyside Advisory Council is of vital importance;
3. the focus should be on voluntary compliance in conjunction with enforceable regulations;
4. land tenure issues with regard to squatters must be resolved;
5. support research that benefits its management – various research bodies all have different agendas and this should be rectified so that there is one focus: to improve the Speyside Marine Area through the use of science;
6. monitoring must be done in order to determine whether management actually achieves their goals – results must be communicated and this would assist in helping people appreciate, follow, and self-enforce management strategies; and
7. all user groups must be involved closely with management to ensure success.

The emphasis on the need for community involvement is interesting and important to note. The IMA (2001) suggests that the Speyside community (with THA direction) manage the reef system and ultimately, the Marine Park.

In the proposed management plan's Executive Summary, the Institute (2001, ii) states that "the THA would have the responsibility of harnessing the stakeholder resource with a view to gathering a wide spectrum of community members, i.e. fishermen, DTOs [dive tour operators], RTOs, hoteliers, and shop owners to assist in management. This would enhance greatly the role of the community in the affairs of Speyside and reduce reliance upon government." This push for community involvement at all levels of management marks a recognition of a need to move away from an entirely centralised regime to one that is more holistic, adaptive, and collaborative. That is not to say, however, that the draft plan is advocating a non-hierarchical and entirely bottom-up approach. A structural and legislative framework would still be applicable and it would reflect that which currently supports the Buccoo Reef Marine Park. That is, the SRMP will primarily (and directly) be regulated by the 1970 Marine Areas (Preservation and Enhancement) Act.²

A number of relevant legislation can be applied to the SRMP. The Tobago House of Assembly Act (1996) gives the THA the authority to formulate and implement policy and measures related to "state lands, terrestrial and marine parks, tourism and the environment" (IMA, 2001, 3-2). In addition, the Act also empowers the THA to enter into Memoranda of Understanding with other institutions and to "take all steps necessary for the exercise of its powers and the discharge of its duties" (IMA, 2001, 3-2). The Environmental Management Act (1995) may also be applied under the auspices of the Environmental Management Authority – the body that has been deemed "responsible for management and conservation

of the environment of Trinidad and Tobago" (IMA, 2001, 3-3). The Authority may also collaborate with other relevant institutions and organisations (including the IMA) as it works towards fulfilling its mandate.

While the THA has jurisdiction to manage up to six miles from the high water mark to the open ocean or sea, there is still no real comprehensive policy that oversees the coastal and marine environments. Based on this lack of clear policy, it becomes increasingly important for different ministries and stakeholders to work together to limit duplication and redundancy as well as to ensure that conflicting activities and institutional mandates are reduced.

At the same time, as the IMA (2001) suggests, these structural approaches should be balanced with governmental and nongovernmental partnerships. Moreover, both top-down and bottom-up processes should be adopted since they allow for the exchange of constructive opinions and ideas. At the same time, they also ensure that both government and primary stakeholders have the opportunity and ability to inform management practices and decisions. While it is an important step in theory, action must be taken by the THA to implement it.

The IMA's (2001) recommendation is somewhat ironic. Public participation in marine protected area management should occur during all phases of planning, design, creation, management, monitoring, and evaluation. Indeed, it is the first steps of the process that set the tone for future action. The irony lies in the fact that while the IMA (2001) stresses the importance of participation and collaboration with the Speyside community, the Institute, itself, did not follow its own advice when it developed the draft plan. As previously mentioned, the IMA conducted a series of studies of the Speyside area that helped with the development of the final draft management plan. These studies were extractive in nature and did not involve consultation, let alone participation, of Speyside community members until the community fervently complained and protested (Alexander, 2002c, pers. comm.; Sandy, 2002d, pers. comm.). Even still, some community members maintain that the consultative meetings that were held by the IMA were "exclusive" and the wider community was not involved; they never considered themselves part of the process (Speyside Community Meeting, 2002). Thus, while the IMA is attempting to learn from the BRMP management plan's limitations and deficiencies by advocating increased community involvement in the creation and management of the area, it appears as though many of the same mistakes were repeated.³

Deconstructing the Proposed Management Plan

In Need of a New Start

Between 27 and 29 May 2002, a joint effort between the Department of Marine Resources and Fisheries and the author in the form of a rapid rural assessment was conducted in Speyside. The RRA was used to determine the level of awareness of state plans to create a marine park, the level of acceptance of these plans, and the level of interest in increased stakeholder involvement. An RRA, by nature, is primarily extractive in terms of output – researchers usually gather information in a relatively short amount of time without any real return to the informants. In order to make the initiative more participatory and informative for the Speyside community, a public meeting was held at the local

community centre two weeks after the completion of the assessment. The public meeting was used as a forum to disseminate the results of the RRA and as an arena for public discussion where concerns and questions regarding the results and the proposed Speyside Reefs Marine Park could be raised.

Approximately five percent of Speyside's population (54 people) were interviewed by two teams of two to three people over the three-day period. People from a variety of stakeholder groups and socio-economic backgrounds were approached. That is, fisherfolk, hoteliers, guest house owners, restaurateurs, dive operators and workers, reef tour operators and representatives, tradespeople, government representatives from the Tourism and Public Works departments of the THA, Village Council representatives, representatives from the school system, shopkeepers, life guards, sanitation workers, visitors to the area, and other community members were interviewed (Appendix 1.7). Each stakeholder was able to voice their opinions and concerns in a relaxed atmosphere. Discussion was guided by a series of questions and issues. The depth of the responses depended upon the stakeholders, their interest in the issues, and their familiarity with the Speyside marine area (Appendix 4.4).

Understanding Speyside's Position: results of the rapid rural appraisal

The results of the RRA indicated an awareness of the THA plans to create a marine park in Speyside – 59.3 percent of the informants were aware. When asked whether they supported these plans, a resounding majority of all those interviewed (90.7 percent) stated that they were (compared to 5.6 percent who stated that they did not agree with the plans and 3.7 percent who did not voice their opinions).⁴ It should be noted that this support was not always given at the outset. This is particularly true for those who were not initially aware of the plans. It was found, however, that after some discussion and information, respondents became more positive and supportive.

Despite the high approval rate, concerns were raised regarding the negative impact that the SRMP could potentially have on the village. These concerns were primarily social and economic in nature. Negative impacts that were identified included:

1. a belief that only those who are already benefiting from the marine area (and from Speyside, in general) will continue to benefit after the Marine Park's creation (for example, hoteliers and dive operators), while those who are already disadvantaged will remain so;
2. a loss of employment – primarily in the fisheries sector since fishers may no longer be able to fish in the area ("no-take" zones may also extend to include the prohibition of the removal of conch and lobster in the area);
3. a concern that the establishment of the Marine Park may encourage further large-scale development in the form of large hotels in an area that is known for its undeveloped natural beauty;
4. the size of the boundaries – some informants stated that the proposed boundaries are too large while other maintained that they do not encompass enough area; and

5. apprehension about the inclusion of the village of Speyside within Park boundaries and how this will affect their daily lives and routines as community members.

Of course, not all impacts would be negative. Indeed, most community members believed that the creation of the SRMP could significantly and positively contribute to the village and its inhabitants.

Potential benefits of the SRMP included:

1. an increase in protection of the reef system and the larger marine/coastal ecosystem;
2. an increase of tourism in the area;
3. an increase in employment opportunities (particularly of those related to the tourism sector);
4. an increase in the number of people diving in the area, in turn, and increase in business for dive operators;
5. an increase in development of the area and subsequent increased access to (and the quality of) public services and utilities;
6. an increase in public awareness about conservation and environmental issues; and
7. another reason for Speyside community members to take pride in their village.

These opinions on both the positive and negative affects of the proposed SRMP on the social, economic, and ecological conditions of the village also influenced their views on how the area should be managed.

Zoning the marine portion of the protected area was generally supported by the community members interviewed. It was acknowledged that zonation would help separate conflicting activities and help with the enforcement of laws and regulations. There was general agreement among the informants that swimming, snorkelling, sailing, wind surfing, reef tours, scuba diving, and the removal of driftwood and shells from the beach should be allowed to take place within Park boundaries. Removal of coral and anchoring (without the use of mooring buoys) were not supported. There was, however, no agreement on whether fishing and jetskiing should be allowed.

The issue of jetskiing is not as complicated as that of fishing – jetskiing currently does not occur in the area and preventing it should not be difficult since sea conditions (strong currents and winds) are not conducive for it. Reaching consensus on fishing within the proposed boundaries will be much more difficult to achieve. Amongst the people interviewed, community members agreed that trolling and beach seine should be allowed to occur while fish potting should not. There was no agreement on whether spear fishing, filleting, and the removal of conch and lobster should be permitted. At the same time, it is more than likely that disagreement over types of fishing methods (and, indeed, fishing in general) that should be allowed to occur within the SRMP is more prevalent in the community than these results indicate.

As a village that is highly dependent on fishing in historical, cultural, and economic contexts, banning all forms of fishing within the proposed boundaries will be difficult. This will be especially true if fisherfolk are not invited to participate in the process of boundary delineation, an examination of alternative livelihoods, and an exploration into whether or not all fishing methods should be banned, limited, or controlled through quotas and/or closed seasons and/or zoned areas. Indeed, many of the community members interviewed voiced the opinion that community participation, in general, is important

– it will help foster co-operative relationships among stakeholders and increase the potential for voluntary compliance and self-enforcement of Park regulations. It should be noted that while only 33 of the RRA participants addressed the issue of potential management strategies for the SRMP and the level of community involvement within the regime, 27 of those 33 maintained that management should involve collaboration between government bodies and the community (ranging from formal incorporation of the community into an Advisory Board to local consultation). Only three respondents maintained that it should be a purely government responsibility. An equal number suggested that the Speyside community should manage the area without government involvement.

The Community Perspective

Many of the views expressed by individual community members were reiterated during a community meeting held two weeks after the completion of the three-day rapid rural assessment. That is, concerns regarding the social and economic impacts of the protected area on the village were voiced. It appears, however, that many of these concerns were rooted in a lack of clear understanding of what the creation of marine protected area entails and means for surrounding communities. These ideas were partly fuelled by the fact that the process was never comprehensively explained to the village members by either the IMA or the THA. Community members stated that they would not support an initiative that would prohibit them from standing on their beaches and pursuing a livelihood of their own choosing. Moreover, a belief that local businesses would be displaced by large, foreign-owned multinational corporations led to further feelings that local people were being negatively impacted for the benefit of foreigners and the tourism industry (Speyside Community Meeting, 2002).

Employment displacement was also a source of apprehension. Since plans for the creation of the SRMP were first proposed, rumours have circulated about what it will mean for the local people and especially for the fishers who use Speyside as their base of operations. One community member, in particular, stated that owning a business is one of the most powerful things that a person can do with regards to earning a living. It is difficult to accept having to work for someone else after being self-employed and even more difficult to accept having to adopt an alternative livelihood altogether.

There was much fear that the creation of a Marine Park in Speyside would undoubtedly lead to a loss of jobs. In an effort to allay these feelings, the representatives of the Department of Marine Resources and Fisheries who attended the community meeting, namely, Potts, Sandy, and Alexander, addressed the community members. These representatives informed those in attendance that the area *may* not be entirely closed to fishing. They also stated that people will not have to change the way they live solely to accommodate the needs of visitors/tourists and that final decisions must be made and management approaches must be adopted with the help and input of the community and relevant stakeholders.

These statements, however, did not completely alleviate the scepticism that those in attendance had towards the idea of consultation and community involvement. Indeed, one community member stated

that while government officials may say that community input into the plan is essential, the comments that they have thus far made have not been accounted for (Speyside Community Meeting, 2002). This statement was made with reference to community input into the IMA draft management plan – a document that they have not seen. Frustration about not receiving clear information and THA maintaining that the community will be a part of the process also led some villagers to assert that they do not have the power, influence, or voice to shape or direct management plans and/or practices. These statements were countered with those that recognised that lack of community influence was not the result of limited power or voice, but rather with a lack of organisation and education (Speyside Community Meeting, 2002).

As the meeting progressed, the calls for education, training, and in essence, capacity building were echoed by a number of villagers. At the same time, feelings that Speyside and adjacent communities (particularly Charlotteville and Delaford) have not received the attention that southwest Tobago has had, have affected community-government relations. An example of this tension can be seen with the volunteer marine warden training programme. The first phase of this three-part programme trained 25 interested community members in July 2001. This phase, sponsored by the United Nations Environment Programme, focused on educating the volunteers about the marine environment. Upon completion of this programme, the 25 participants will be certified marine wardens.

Community members learned during the 13 June 2002 meeting that four or five people from the Speyside/Charlotteville area had participated in the programme. Many members thought that the number of people involved from northeast Tobago were too few. Other members charged that it appeared as though the people who were chosen to participate were “hand-picked” (Speyside Community Meeting, 2002). Potts, Sandy, and Alexander explained that the programme was advertised by radio, pamphlets, and posters and that participants were chosen on a first-come first-serve basis, as long as the applicants had met the basic requirements (for example, scuba diving certification or a willingness to become certified). Potts indicated that more training programmes would be held. Villagers who attended the 13 June meeting were not pleased, maintaining that there are “people [in the Speyside area] who are willing to be wardens – they just need to be trained” (Speyside Community Meeting, 2002). Their feelings are valid: southwest Tobago has had more government attention than the northeast region. Much of this can be attributed to Scarborough, the capital of the island, being located in the southwest as well as the level of economic and infrastructure development that has occurred in that region to support a burgeoning tourism industry. Regardless of whether these wrongs, slights, and/or inattention are perceived or real, the fact that community members believe that they have (and still do) exist is important and should therefore be addressed by the THA. By addressing community frustrations and needs, both state and community will be in a better position to address the integrated economic, social, and environmental issues that the area is now facing.

An Assessment

It would be difficult to make recommendations on the exact process that needs to be developed by the actors involved, especially when it would be based on 54 interviews and a single community meeting. The results of these interviews and meeting should rather help to inform the direction that government and community could take with respect to natural resource management. Ultimate decisions must be the product of government-community collaboration. No one outside of the situation can determine what action should be taken – and this is partly exemplified by lack of support for the IMA's 2001 initiative. While the IMA did not outline a clear management programme, the Institute (2001) did suggest possible plans of action that required community participation. This participation, however, should have begun with the formulation of the management plan.

Three plans regarding the management of the Speyside area have been created:

1. the Department of Natural Resources and the Environment, THA's plan for northeast Tobago;
2. the European Union's plan for a park system; and
3. the Department of Marine Resources and Fisheries' proposed SRMP plan (Speyside Community Meeting, 2002).

With three plans having been formulated and all having some relevance to the Speyside area, questions have been raised by the community about whether the three institutions that conducted, called for, or sponsored the plans will collaborate to create one comprehensive document. If these bodies do not co-operate, it raises further questions about their ability to work with the stakeholders that will be affected by the plans' implementation – that is, if the institutions are unable to co-operate, can co-operation between primary and secondary stakeholders (and perhaps external, as well), with their various and sometimes divergent positions and interests, really be expected?

Within their draft plan and supporting studies, the IMA provided some important baseline information in addition to calls for more detailed research and analysis. While an MPA could be established with the information that is currently available and be based primarily on the precautionary principle, it may be difficult to do – especially if it were to be a unilateral move by the government or take place in the atmosphere that currently exists in the area. The heavy reliance on natural resources (particularly fish) and a vocal opposition (partly due to a lack of understanding) can have a significant negative impact on the implementation and success of the Marine Park if they are not adequately addressed from the beginning of the initiative. The impact that this can have on the proposed SRMP management plan is substantial. The IMA's 2001 SRMP management plan not only needs to be revisited, but also re-written.

The IMA's 2001 draft plan provides an important foundation on which to build. That is, its recommendation that the demarcated area be designated a "managed area" and then converted into a "protected area" should be seriously considered. This approach may allow for an easier transition for government and community in terms of implementation, management, enforcement, and acceptance. Moreover, the information in the draft plan and associated documents also provides important baseline

socio-economic, ecological/biological, legislative, and public awareness data that can support further research initiatives. Additional research that is required should be conducted in conjunction with the community. Collecting data that is both scientific and traditional in nature⁵ and by using the expertise of those who are most connected to the area and its resources (for example, fisherfolk and divers) will access information that may not otherwise be readily obtainable. It also allows for rapport to be created among researchers, local villagers, and government representatives.

Efforts to involve resource users in data collection programmes are already underway. The Department of Marine Resources and Fisheries has initiated a Reef Check programme that involves divers and dive operators collecting data on species diversity and richness. Fisherfolk should also be incorporated into the process. Fish nursery areas, migration patterns, spawning sites, and fish abundance are critical information that needs to be determined so that management strategies can be decided upon and designed. This information can also help government and stakeholders to arrive at a consensus on the boundaries of the managed area and eventually the Marine Park. This may require holding individual meetings with the various stakeholder groups to determine their needs, priorities, and positions. At the same time, one-on-one meetings between community members and Department representatives should also be held. The purpose of these meetings is to provide a forum for individuals to express their concerns and expectations for the area and its management. Both types of stakeholder meetings should be followed by larger meetings that involve the general public and stakeholder group representatives. These meetings should focus on the final and finer details of boundaries, zonation, and user fees. Holding these different types of meetings helps to ensure that constructive collaboration can take place rather than a form of basic and somewhat superficial consultation that does not necessarily address let alone incorporate the views of the stakeholders.

The IMA (2001) notes the importance of the Marine Park being self-financing. The idea of user fees, permits, and taxes is a sensitive one. Steps have already been taken towards introducing a scuba diving-oriented user fee. Sandy (2002b, pers. comm.) and Sampson (2002, pers. comm.) explain that an Executive Note was submitted in 2001 to the Central Government of Trinidad and Tobago's Executive Council by the Department of Marine Resources and Fisheries. This Executive Note suggested a monthly fee of TT\$1000.00⁶ be applied to the island's DOs. The TT\$1000.00 fee was decided upon after average dive shop income was calculated. The fee would be applied to cover the costs of operating the country's hyperbaric chamber, monitoring programmes, enforcement, and conservation efforts. Dive operators and scuba divers (local and foreign) were not consulted about their views on the fee while the Note was being developed. Indeed, meetings were not held with the stakeholders (including the Association of Tobago Diver Operators [ATDO]) until the Note was sent back to the Department by the Executive Council, stating that it was in need of revisions.

Sandy (2002, pers. comm.) maintains that these "revisions" also included the need for some form of consultation with the dive operators. Even after the Note was sent back, however, the "consultation" that was held by the Diving unit of the Department consisted only of a meeting with ATDO during which

the operators were informed that a dive fee of TT\$1000.00 per month would be introduced as soon as the Note was passed by the Executive Council. The DOs were aware of the fee because a copy of the Note had unofficially been given to them. This knowledge, however, only fuelled their anger – the Note had been developed without consultation and was based on old data that did not reflect the current and significant slow down in the industry. Some operators maintained that they would not be able to afford such a fee and having to pay it would lead to their bankruptcy (John, 2002, pers. comm.). Sampson (2002, pers. comm.) states that in order to make enough money to cover the expenses of running a dive shop and paying the fee, an operator would have to conduct at least three dives per day for 20 days each month – a task that may be difficult to achieve considering Tobago's currently poor dive industry state.

It should be noted that dive operators are not necessarily against the institution of a user fee system and increased regulations (de Baer, 2002, pers. comm.). The system that would be more acceptable, however, would be one based on the number of divers or dives each operator takes into the water and with the fee being directly applied to divers rather than the operators. Both John (2002, pers. comm.) and Sampson (2002, pers. comm.) admit that some dive operators may try to circumvent the system by changing their logbooks or by accepting cash. Thus, a system that uses dive tags or badges matched by effective and regular enforcement patrol may be more effective. It has been suggested by some government representatives that a monthly user fee will eventually be replaced with a per dive/diver-base permit system. It could, however, be argued that this may prove to be more difficult and time consuming since it would require sending an additional Executive Note to be reviewed (and passed) by the Executive Council.

With the current Dive Note still under review at the Department level, the dive industry in Tobago is not being regulated. The need for both regulations and revenue generation is apparent – the island's reefs need to be studied and conserved and divers comprise a large and important group of reef users. The government, in essence, has three basic choices:

1. to resubmit the Executive Note with a clear explanation of its decision to choose the monthly user fee approach;
2. consult with dive operators, note their concerns in the Dive Note but counter them with arguments that support the monthly fee approach; or
3. to initiate a process that can be lengthy but that is more collaborative – that is, to meet with the island's dive operators (with a neutral facilitator and/or mediator) and arrive at a mutually acceptable decision.

While the dive industry may be experiencing a slow down, dive operators remain a strong and influential force in terms of their ability to shape tourism policy. By taking an adversarial approach with the introduction of new industry regulations, the Department of Marine Resources and Fisheries will not only face the vocal protests of the dive industry, but also pressure from the Department of Tourism. A more pragmatic approach would be to go through the process once in a co-operative manner with the dive operators. Moreover, it will help to set the precedent on which future discussions with other stakeholders

and reef users can be based, particularly RTOs and those who moor boats in Tobago's waters – not just within its Marine Park(s). Indeed, Sandy (2002b, pers. comm.) states that the Department would like to institute a user fee system for reef tours that would most likely be based on the number of visitors taken onto the reef by each operator. The creation of a user fee system for both dive operators and reef tour operators will not be easy – it will initially be time-consuming and will require personnel to ensure that the established user fee system is being followed. These are perhaps reasons why the Department may be apprehensive about instituting a per visitor/dive/visit fee and is leaning towards a flat -fee system. Nevertheless, short-term difficulties should be compared to the long-term benefits of income generation, environmental impact, and government-industry relations.

The return of the Dive Note to the Department of Marine Resources and Fisheries should not be considered a setback, but rather as an opportunity for new beginnings and conflict resolution. The fact that conflict mediation will be required is not surprising considering the steps that the Department is trying to take are unprecedented on the island. This tension, however, is compounded by that among the dive operators themselves – primarily between, but not limited to, local and foreign operators, with small dive operators feeling threatened by larger businesses owned by relatively wealthy expatriates. Indeed, it may be as difficult finding a mutually acceptable decision between the local and foreign operators (and/or those who are a part of ATDO and those who are not) as it may be between the dive stakeholders as a group and the Department of Marine Resources and Fisheries. Of course, the Department of Tourism and the Tourism and Industrial Development Company should be included in the discussions.

With particular respect to the proposed SRMP, these discussions can help inform how tension among other stakeholder groups can be addressed and resolved – including that within the local Village Council (between the supporters of the island's various political parties) as well as between the tourism and fisheries sectors. The damaging ramifications of not adequately dealing with the tension between the latter groups has been seen in the southwest region of the island.⁷ Proactive steps to outline fishers' access and livelihood rights in the area should be clearly presented before further tourism-related development is permitted. With regards to the former potential conflict groups, politicisation of the establishment and management of the SRMP must be avoided if full community participation is to occur. Indeed, some community members (Anonymous, 2002a, pers. comm.; 2002d, pers. comm.; 2002e, pers. comm.) stated that the Speyside Village Council is divided for the most part between supporters of the island's dominant political parties (the National Alliance for Reconstruction, the People's National Movement, and the United National Congress). Decisions made during Village Council meetings tend to be made along these party lines. Such party politics, one community member (Anonymous, 2002e, pers. comm.) maintains, could potentially "lead to the downfall" of plans and initiatives since supporting the party may take precedence over supporting a programme, project, or policy that will benefit the community as a whole. Thus, this community member suggests that efforts to include villagers within the planning, implementation, and management phases of the SRMP should focus on encouraging individuals to participate rather than asking the Village Council to send representatives.

While many Speyside community members stated, during both the RRA interviews and the larger meeting, that government must allow for community participation, there was no consensus on what that participation should entail. Indeed, some community members believe that a stakeholder/advisory group would not work in Speyside because of the political situation and because of a lack of “serious” dedication to making community-based organisations work. At the same time, these villagers (Anonymous, 2002a, pers. comm.; 2002e, pers. comm.) allowed that a group may work as long as it is facilitated by a local community member and as long as the people involved are “serious,” willing to invest the time and effort required, and understand how the issues affect them.

Community members have voiced some scepticism about the efficacy of community groups – saying that too often meetings are held to discuss problems, concerns, and opportunities, but that the discussion is not translated into action (Anonymous, 2002g, pers. comm.; 2002h, pers. comm.). Thus, in order to ensure that participation and momentum are maintained, short- and long-term goals and activities must be identified and carried out. This, in turn, will show all stakeholders that tangible steps are being taken to ensure the wise-use of the Speyside area. These activities must also be appropriately implemented and “in a way that is good for Speyside” (Anonymous, 2002f, pers. comm.).

Implementation of marine conservation and management measures must take place both on land and in the water. That is, zonation, the limiting or prohibition of fishing, the removal of conch and lobster, and other decided-upon marine-related measures must be matched by efforts to limit and control grey water and sewage runoff, excess sedimentation, coastal erosion and development, and deforestation that takes place within the terrestrial portion of the protected area. These implemented measures must also be complemented by appropriate and effective enforcement of regulations and practices. While one community member (2002f, pers. comm.) states that the community is already conducting informal patrols of the Speyside marine area (for example, ensuring that yachts are anchored properly and in the right areas), others (2002b, pers. comm.; 2002c, pers. comm.) maintain that formal enforcement through the use of patrol officers or wardens will be required, especially if some zones within the Marine Park are to be designated as “no-take.” People from the area should be hired for these warden and/or patrol officer positions – this would help cultivate the “sense of ownership” that Potts (2002c, pers. comm.) states is so important.

Perhaps one of the most important realisations that emerged during the RRA and the community meeting was the lack of information and the amount of misinformation that was circulating within the Speyside area regarding the Speyside Reefs Marine Park. Indeed, there is a resounding call for a public awareness campaign in the Speyside, Charlotteville, and Delaford communities. These campaigns should involve the holding of information sessions, seminars on coral reefs and their associated ecosystems, marine protected areas, community management, and data collection techniques. Moreover, since the results of the IMA studies and the draft management plan were never disseminated to Speyside community members, this still needs to be done. This is supported by Potts (Speyside Community

Meeting, 2002) who states that IMA representatives must explain the studies and their results in a clear and concise manner that can be understood by non-scientists.

At the moment, there is very little, if any capacity for decision-making and management at the community level. The only way to change this situation is by arming villagers with both the knowledge and the confidence that they do in fact have the power to make significant contributions and that they will eventually have the ability to influence the creation and management of the proposed SRMP.

Summary

Creating a marine protected area in the Speyside marine area reflects a proactive move by the THA to protect the reef complex as well as the village's watershed. It also represents an effort that recognises the important linkages that exist between the land and the sea. In order, however, to make it a truly *integrated* initiative, increased public participation is required. While integrated coastal zone management may not have been an objective (primary or otherwise) for the area, the potential for it exists. Indeed, it is apparent that creating and managing a Marine Park in Speyside will be difficult without community support and/or involvement. Government (that is, the Department of Marine Resources and Fisheries) has limited resources and unless a substantial increase in funding is provided to the Department to support the enforcement of protected area laws and regulations, the SRMP will be largely ineffective. To prevent this from happening, a level of community self-enforcement, -monitoring, and -management will be necessary. Such actions, however, will not be possible without increased capacity and understanding – both of which are currently lacking in Speyside.

Before a Marine Park is formally established in Speyside, government departments and individuals should focus their attentions on educating the public, consulting them on their views, and working with them to integrate their ideas and perspectives into a management plan that is mutually beneficial. In essence, the proposed Speyside Reefs Marine Park is an opportunity to adopt a collaborative management approach. Such an approach requires much preparation and a long-term commitment by both the THA and Speyside. Chapter Five delves into a possible framework that can lead to a more holistic understanding and management strategy for both the community and the proposed protected area.

Endnotes

¹ This area covers Tyrrels Bay in the west to Anse Goulême in the north, and Little Tobago in the east.

² "Buccoo Reef and its Management Plan" (Chapter Three) provides details about this 1970 Act.

³ It should be noted that a community advisory board to help manage the BRMP was also suggested by the IMA in its management plan (IMA, 1995). No clear plan, however, on *how* it could be formed was provided, nor did there appear to be an earnest effort by the IMA to solicit the views and suggestions of

community and stakeholders on how it could be accomplished. This appears to once again be the case for Speyside.

⁴ Appendix 4.4 provides an outline of the issues raised in the RRA. Appendix 4.5 provides the numerical results of the assessment.

⁵ The concept of traditional ecological knowledge is expanded upon in Chapter Five.

⁶ TT\$1000.00 equates to approximately Cdn\$250.00.

⁷ There have been confrontations between beach club owners (and their security guards) and fishers over access to fish landing sites during the last few years – particularly at Pigeon Point, a beach location that requires fisherfolk to use the beach club's private road. A mutually acceptable solution has yet to be found.

Chapter Five: Lessons Learned: The Management of Coastal Environments and Resources

The ocean is part of our surroundings
It's there for anyone
It can be seen near or far
Even from our homes.

The ocean is a home
For some living creatures.
Don't destroy the ocean
For the creatures sake.

In the ocean the waves
Are clashing into each other
The ocean floor is combined of different things
Like stones, rocks and sands.

The ocean is part of life
For people on earth.
So save the sea
And make it as clean as can be.
-L. George (Scarborough SDA
Primary School), "The Ocean"

The Relevance of the Co-Management in a Small Island Setting

Co-management or any form of substantial community or public involvement in natural resource management is not new. Indeed, forms of community-based management have been practiced for centuries on some South Pacific islands (Christie and White, 1997; Gilman, 1997). On islands such as Madagascar and Oceania, the link between humans and their environment was strong and, according to Christie and White (1997, 157), this, along with a "profound respect for animals," "influenced behavior" and "harvest levels in some societies." Based on a system of taboos and sanctions, natural resources were spared from over-exploitation. At the same time, it is important not to romanticise traditional management measures – in some cases it was "management by default." That is, on some islands, such as in the Philippines and Micronesia, small populations and, in turn, limited resource requirements and under- or sustainable levels of exploitation led to the conservation of areas and resources.

These traditional management approaches, however, tended to be replaced by more centralised western-developed systems that were introduced through colonialism. In essence, colonialism resulted in the transferring of governance and management of coastal areas and resources from local to state control and one primarily based on subsistence to commercially-oriented exploitation (Christie and White, 1997). Ruddle, Hviding, and Johannes (1992 c.f. Christie and White, 1997, 158) note that

[a]reas traditionally managed locally under common property regimes have been eroded owing to the pressures of Westernization, rapid population growth, urbanization, commercialization of fisheries, the subsequent re-evaluation of fish as a commodity, with concomitant changes in technology and levels of capital investment, and altered access and distribution rights and obligations. This began decades ago in some places, as colonial governments consolidated their power – a process that has continued under neo-colonial regimes of independent nation centralization.

While the Caribbean region has had a different history from the South Pacific, a colonial past does provide some commonality.

Natural resource exploitation during the post-Christopher Columbus era focused on meeting the demands of European markets. Governance tended to be top-down and structural. This regional situation

was also present at the island level in Trinidad and Tobago. Moreover, this general top-heavy, hierarchical management approach continues to be pursued into the twenty-first century. The legacy of a colonial past and centralised governance has left its mark; while it has worked on some islands, a pattern of over-exploitation, ecosystem degradation, and disjointed environmental policies and programmes is found throughout the Caribbean region. Faced with these problems and this new reality, there has been a move towards coastal zone management systems that emphasise “integrating sociological, economic, and environmental information” (Christie and White, 1997, 159) in a way that also allows for and relies on community and stakeholder participation.

Dahl (1997) suggests that there are two principal reasons as to why increased community participation in natural resource management should replace the creation and implementation of new legislation that aims to address the system’s current shortcomings. Dahl (1997) maintains that these two arguments are moral (or political) and economic in nature. The moral perspective follows from Friedmann’s (1992 c.f. Dahl, 1997, 38) belief that

[a]s moral beings all of us have certain obligations; we compete, but we also learn to work together; we relate to each other according to a complex moral code in which many of our responses are culturally patterned. As moral beings, we have not only wants or desires but also needs, among which are the psycho-social needs of affection, self-expression and esteem that are not available as commodities, but arise directly from human encounter.

Based on these needs is a form of development that allows for not only socio-economic betterment, but also empowerment. Such empowerment, in turn, is possible only in “an *inclusive* democracy” (Dahl, 1997, 39) in which there is a wide delegation of responsibility and accountability. The economic argument for an increased community role in natural resource management is based on the false idea that without strict regulations, resources in an open access system (such as those found in coastal environments) will be over-exploited. Instead, there are a multitude of cases where resource users have not only been able to self-organise but also to self-regulate their natural resource use – at times, more effectively than the state (Dahl, 1997). Indeed, examples of how government-controlled areas and resources have fared less than well and have not been able to elude the disasters of over-exploitation include the cod fisheries off the Atlantic coasts of Newfoundland and Nova Scotia and the anchovies industry off the Argentinean coast. Although no coastal or marine resource-based industry has collapsed in Tobago, the ecological health and integrity of the Buccoo Reef Marine Park has suffered from a lack of integrated coastal zone policy, limited enforcement of the laws and regulations that do exist, coastal development, destructive sporting activities, dropping of anchors on fragile reef areas, and poaching. These problems are compounded by limited government personnel and funding that are required for a state-controlled and -operated Marine Park. Clearly the conventional approach to coastal resource management has not worked for the BRMP; something must change.

One of the main reasons for creating a marine park is to protect and conserve the area and its resources. In addition to having laws and regulations that formally support its “protected area” designation, there must also be a shift in the human attitudes and behaviour that often negatively impact

the area. Indeed, while laws, regulations, and enforcement are able to address the impacts and negative activities that can lead to the area's and its resources' degradation, the real reasons behind the effects remain. That is, many of the causes are related to learned behaviour and a disconnection between understanding/awareness and action. Thus, as Fiske (1992, 38) suggests, the creation and management of MPAs should be seen as "a type of planned social change." Such social change cannot be directed or forced from above. Rather, it involves working with communities in a concerted effort to incite change from within.

A Tale of Two Parks: the Buccoo Reef Marine Park and the proposed Speyside Reefs Marine Park

Two interesting case studies emerge out of Tobago – the Buccoo Reef Marine Park and the Speyside Reefs Marine Park. The former Marine Park offers an example of an already-established protected area that is in need of proper management. The latter, meanwhile, is a Marine Park in the making. While a draft management plan has been created, it has not been formally accepted and the area has not been legally designated as a protected area. At the same time, the SRMP provides an important opportunity to implement a management system that can learn from the mistakes and strengths of the BRMP and the attempts that have been made to manage it.

The BRMP, located in southwest Tobago (or in what could be considered the heart of the island's tourism sector), is greatly affected by the amount and type of growth that occurs in the area. While grassroots political activism does exist within this part of the island, apathy and "lackadaisical" (Trim, 2002, pers. comm.) attitude also run deep, especially with regards to natural (and coastal) resources management. That is not to say, however, that community members are not concerned about the degradation of the coastal environment; they are. At the same time, their involvement in *actively* addressing this degradation is limited. There appears to be a general belief that it is the government's responsibility to ensure that Tobago's coastal and marine environments are used and managed wisely. These feelings perhaps reflect an acceptance of the traditional, western world approach to governance that stems from the island's colonial past in addition to the strength of preoccupation with developing the tourism industry. This, however, is slowly changing. This shift in attitudes is predominant in individuals who are already aware of other places in the Caribbean where communities are more involved in coastal zone management.

The BRMP provides an interesting example because it raises the question of the need, purpose, and level of co-management that the area requires. That is, fisherfolk use the BRMP primarily as a launching and landing site, RTOs use it for daily tours, and there is some diving, although this very limited. Swimming, snorkelling, and other watersports are popular activities. Conflict between users is predominantly between those in the fishing and tourism industries and related largely to issues of access rights. Thus, the benefits of co-management include the facilitation of dialogue between these key stakeholders. It could also help to end damaging activities, including reef-walking and jetskiing, limit

coastal development, curb poaching, lead to the installation and maintenance of mooring buoys, pressure for proper wastewater treatment programmes, and implement reef rehabilitation initiatives. In essence, increased public involvement could lead to more effective management that in turn would help restore the Marine Park and ultimately, help to maintain its health and integrity.

The creation of a stakeholder-based advisory board or a CBO offers an opportunity for collaboration with government departments to access international funding and to implement project and programmes that can lead to social, economic, environmental, and aesthetic improvements. A lack of government personnel and funds has impeded the implementation of state-initiated measures; Alternatives must be sought. Moreover, as the boundary of the BRMP currently exists, the Marine Park is almost entirely marine. The boundaries should be extended to include a terrestrial component since it is clear that land-based activities (whether it be the construction of houses, pesticide use, or the generation of wastewater) are detrimentally affecting the health of the Buccoo Reef system. Extending the boundaries, however, would then mean that collaboration with and active participation between the surrounding communities and government would no longer be only helpful, but essential.

Speyside and northeast Tobago differs from the southwest region of the island in a number of ways. While tourism is important to the area, the extent of it is only a fraction of that of the southwest region. This smaller-scale tourism has allowed for greater diversification in livelihoods and a difference in perspectives regarding the environment and community “ownership.”

The creation of the SRMP would entail the encompassing of the village of Speyside within Park boundaries. It would affect the lives not only of the fisherfolk, RTOs, and dive operators who rely on the water and its resources for their livelihoods, but also all community members and commuters to the village. This situation helps to make it unique from the BRMP.

The establishment of the SRMP could have a significant impact on the amount and type of fishing that takes place within Park boundaries. Thus, the potential for conflict is great, again, particularly between the tourism and fishing industries. Community members have already expressed concern about the economic and social impact that the Park’s establishment will have on Speyside. A perception that the reef ecosystem is in good health has caused some members to question the purpose of a marine park and the regulations that come with it – why introduce more formal management requirements when what currently exists seems to be working (especially when the ineffective BRMP is considered)? The fact that rumours and false information have been circulating about the Park and what it means (politically, socially, and economically) have not helped. Within this somewhat agitated environment, the importance of enveloping the community and stakeholders into some form of collaborative arrangement cannot be over-emphasised.

For the management of both the BRMP and the SRMP, it is important to learn from past experiences on the island, in the region, and even internationally, for example in the South Pacific where successful and unsuccessful attempts at participatory management have been made. At the same time, it is crucial that the context of the area that is under consideration always be remembered and understood.

Situations, communities, and stakeholder dynamics are complex and unique. Indeed, the relationships among the community, government, and implementing agencies have a profound influence over how management programmes and initiatives will unfold.

A Plan of Action

The Context

Jorge (1997, 51) writes:

Because of the site-specific circumstances underlying these frequently encountered perceptions, the application of generalized guidelines for achieving community-based management, and conservation in particular, of coastal resources is often ineffective if these are not carefully adapted to the local political and social context, taking account of local values and priorities in spite of the divergence from the planners or conservationists' perspective which might emerge.

While still considering Jorge's (1997) statement, it should also be noted that examples of successful and local participation abound throughout the world and that there are certain characteristics within these examples that are common. Indeed, Christie and White (1997), Dahl (1997), Fiske (1992), Gilman (1997), Jorge (1997), Olsen, Tobey, and Kerr (1997), and Yates (1994) have all described situations in Latin America, the Caribbean, and the South Pacific involving the creation of marine parks and/or the management of coastal resources and attempts (some successful and some not) to increase community participation and involvement. The successful attempts described have all reflected and included common basic steps and understandings. Thus, a general plan of action can be suggested that provides enough guidance to help coastal resource managers while, at the same time, remaining flexible to accommodate and consider the local (and in this case, Tobago's) context. Of course, past experiences with community involvement in Tobago, namely with BRAG, can and should also be drawn upon to inform this general framework.

A collaborative management process should be able to address local needs within a regional setting – this is especially important if an integrated coastal zone management programme is to be pursued. Furthermore, Jorge (1997, 58) maintains that such a process should be:

1. sequential and cyclical: not all issues can be dealt with at the same time and therefore they may need to be prioritised and the process may need to be repeated for each issue;
2. flexible: projects and initiatives should be able to respond to outside pressures and opportunities and adapt accordingly; and
3. iterative and expansive: lessons learned from initial planning and implementation efforts should help inform future management cycles that would include more issues and a larger geographic area.

In essence, this approach advocates starting slow within a limited area and with a limited scope with short-term goals while ensuring that these characteristics are embedded in a broader framework that allows for growth, expansion, and long-term objectives.

The Framework

An integrated coastal zone management strategy that can address Tobago's situation in terms of its established and proposed marine protected areas does not have to be (nor does it need to be) revolutionary. Working from what already exists – both the good and the bad – and learning from and building upon past experiences may prove to be sufficient to restructure and improve the existing system.

White *et. al.* (1994b) offers a potential framework that can guide the implementation of a participatory-oriented marine resource management programme (Appendix 2.17). Some concern regarding the framework may arise due to the processes' design and illustration. It uses a compartmentalised approach based on one-way arrows and boxes to describe a process that relies on flexibility. At the same time, it is only an illustration. While it could be augmented with two-way arrows, loops, and spirals, in the end this is not what matters. What is important is that as a framework, it provides a sense of balance and direction – both of which are needed in a process that can be daunting and chaotic, especially for people who may not be familiar or comfortable with uncertainty. Moreover, even within the most chaotic of circumstances, patterns and normalcy still exist.¹ Thus, adopting White *et. al.*'s (1994b) framework does not diminish the process' ability to remain adaptable to changing conditions, requirements, or players.

The framework begins with the recognition that a current management strategy is not functioning as it should be. Potts (2002c, pers. comm.) acknowledges that coastal and marine resource management and particularly MPA management in Tobago can be improved. After accepting this reality, steps can be taken to explore the alternatives. With structural approaches on their own being expensive and ineffective, adopting plans of action that target behavioural responses through a more participatory programme may prove to be more successful in Tobago. It should be noted that for a situation where participatory planning and management are minimal (if they exist at all), how stakeholders are incorporated into the process is just as important as the results of the new management strategy.

Action learning and contextual action research (CAR) together provide a praxis methodology that understands that initial contact and interaction among the stakeholders (private and public) lay the foundation for how relationships will unfold and develop. According to Franklin (1993, 2), the essence of action learning

draws on a contextual epistemology in which knowing and learning are based on individual and collective views of a situation, which can lead to empowerment at the community level. Action learning is an approach to social change – a collaborative process used for addressing complex problems in ways that reflect the varied interests associated with the problem's 'domain;' it is a process that is designed and driven by the participants themselves creating real ownership and commitment to the change process. Action learning encourages the development of processes which foster connections with local culture.

Action learning, therefore, is a process defined and determined by the stakeholders and local participants, themselves. There is no "standard model" or one correct way for the process to unfold. Indeed, it reflects

the distinctiveness and diversity of the participants, their needs, visions, values, and culture. Moreover, action learning can be seen as a horizontal approach to planning and decision-making in the sense that all participants 'are given an equal voice in the process' (Franklin, 1993, 2). It should be noted that action learning is not a short-term initiative. Rather, it is "a continuing process of self-inquiry" (Franklin, 1993, 3). Thus, adaptation to changing conditions and circumstances is critical; flexibility is key. Such an approach can be further applied to the management process.

CAR has evolved from action learning and incorporates the latter's call for interconnecting and fostering collaboration between all the stakeholder and interests (with regards to the issue/problem) while at the same time "developing action strategies for social change" (Franklin, 1998, 55). Franklin (1998, 55) describes the CAR methodology: it is based on a

collaborative consultation process between *outside researchers* acting as facilitators and catalysts, and *inside stakeholders* engaged in addressing issues of immediate significance to their lives. The *participatory* nature of contextual action research engages participants, collaborating as co-researchers, in: the definition of the critical research questions using both local and global perspectives; the framing of these questions in their own context; the design of the process used to address the research issues; the decision-making regarding whom should be involved/invited to participate; and the evaluation of the data and knowledge generated as well as the success and "failures" associated with interventions aimed at social change...The participation of insiders in the design and practice of the research leads to the development of learning strategies that reflect the actual nature of the problem as it is understood by those most directly involved, as well as the ways in which it is informed from an external and analytic perspective (Franklin's emphasis).

Such an approach to planning, decision-making, and management is relevant to multi-stakeholder and – interest situations where complexity and uncertainty are high.

Being innovative and "creating new alternatives where non existed before" (Franklin, 1998, 61) allows for an acceptance of change and long-term perspectives. That is, the approach instils an understanding that responding to immediate problems with short-term solutions will not completely eradicate all problems – new ones emerge as situations change. A long-term commitment to the strategy by the local participants is required, but such a commitment must come from the participants themselves – that is, the desire must come from within.

According to the CAR framework, the interaction between the "outside" researchers (and perhaps even government representatives) and the "inside" stakeholders is based on the understanding that much value rests on the knowledge that is generated by the local participants. At the same time, CAR encourages and allows for such insiders to understand, shape, and alter their situations and realities (Franklin, 1998). In essence, insiders become co-researchers. Outsiders, meanwhile, become personally and actively involved and engaged in the problem setting. The outsiders become participants in the process and help *facilitate* capacity-building and open communication in the context and conditions of the insiders' "own sociocultural knowledge" (Franklin, 1998, 67).

Action learning and contextual action research represent the first steps in instituting a more collaborative approach to coastal zone management. They also represent what was missing in the

Buccoo Reef Action Group. While the researchers and facilitators were able to become insiders, it is questionable whether the participants ever expanded out of their initial insider role. Granted that the facilitators voiced their concerns about the limited involvement of Group members in project design, no concerted efforts were made to draw them more fully into the process. Community members lacked both the capacity and confidence to strengthen their positions and these are two characteristics that are essential for increased local involvement in MPA management-oriented projects to be successful. Moreover, short-term Group goals were never replaced with more long-term objective or strategies. Of course, the fact that the actual creation of the Group stemmed from a research project is striking – the desire to organise may have existed within the community, but was there a push by these interested community members to follow these sentiments with action?

What resulted was a somewhat superficial attempt at community organisation and resource management. This is not to say that what occurred was not significant; it was. Important lessons are to be learned from the experience – one of the most notable being that what happens at the beginning of any process/initiative will profoundly affect both how the initiative will unfold and its subsequent results. There must be a proper base from which to work otherwise time and resources will be wasted because the effort cannot be sustained.

Success is rooted in education; it is awareness of how a person's actions and perceptions affect their social, economic, political, and natural environments that will lead to organised change. People must be aware of their options. While Tobagonians are generally aware of the state of their coastal and marine environments, people are becoming increasingly disconnected from them. Although agriculture and (more so) fishing are important contributors to the island's GDP, overwhelming emphasis has been placed on developing the tourism industry through the creation of hotels, guest houses, beach clubs, restaurants, and night clubs. Holmes (2002, pers. comm.) counters the argument that tourism is the greatest income generator for the island by stating that when the amount of financial assistance the industry requires is accounted for, it is in fact making less net income than the fishing industry which receives few subsidies. Regardless, more emphasis has been placed on development and material wealth, even if it is at the expense of the coastal environment.

Gua Gua La, a Cherokee author writes: "But all was not well with the People of the Earth, who forgot their mutual beginning in the womb of the sea and claimed a separate creation for themselves...They stood alone on a high hill in the darkness, hearing and seeing nothing of the world around them" (c.f. Peterson, 124). Forgetting what makes us human and forgetting where we come from is dangerous – the connection with the land and water becomes broken and our sense of responsibility and ownership becomes clouded. Management (and particularly co-management) requires people to take responsibility for their actions and to understand the impact that they have on marine and coastal environments. Thus, the need to get "back to the basics" (Speyside Community Meeting, 2002) is two-fold:

1. to reconnect ourselves to the natural world; and

2. to become informed about the state of the environment with particular focus on (though not limited to) coral reefs, mangrove forests, seagrass beds, wetlands, fish stocks, unsustainable fishing practices, the land-water link, the impact of wastewater on coral reefs and their associated ecosystems, and conservation approaches.

People must also become aware of the various management strategies that are viable alternatives to conventional approaches, namely participatory management and integrated coastal zone management. Indeed, there must be a general understanding of why new regimes are necessary, how they are to be implemented, and how it will directly and indirectly affect individuals before behavioural changes can or will take place. It must be shown that the “establishment of management tools such as coastal or marine protected area, catch quotas and size limits for fisheries, prohibitions on the use of certain threatened species, and environmental impact assessments...[are not necessarily] instruments for preventing economic growth and the improvement of their living conditions” (Jorge, 1997, 51). Furthermore, community members should know that their involvement is welcomed.

With regards to BRAG, preliminary meetings were held among the BRMP manager, the UEA researchers, and stakeholders to discuss increased community involvement; similar meetings should be held in Speyside. Larger group meetings, however, should be complemented by one-on-one informal interviews, information seminars, and workshops about the environment in both Buccoo/Bon Accord and Speyside villages. It is only after this that a desire and a call for increased community participation can be expected. Of course, people cannot be forced to show interest, commit time or energy, or even care (although incentives and peer pressure could always be used). Community members must choose the role that they would like to play – but this choice must be an informed one. The role of education is multifaceted, it helps

1. stakeholders understand the role and position that they can potentially have within a management regime;
2. governing bodies to appreciate the social, political, and economic conditions/situations of the interest groups that are affected by their decisions; and
3. resource managers to identify what information is lacking.

Data collection (with the help of community members/stakeholders) can help fill this information void. Christie and White (1997, 173) note that the

type of data produced [through a participatory approach] typically is not of the detail or accuracy produced by a scientific endeavor. This can be minimized if training is carefully done, participants are motivated to gather accurate data, and research focuses on monitoring and baseline data collection. The complimentary nature of participatory and scientific research is one reason why a dual approach employing conventional and participatory approaches to research should be considered.

Baseline ecological, socio-economic, legislative, and public awareness data were important components of the IMA's studies for the BRMP and the proposed SRMP management plans. At the same time, the BRMP management plan is now seven years old and important (particularly ecological) information is missing from the SRMP's. Thus, more studies need to be conducted and information needs to be

collected (for both areas) regarding coral cover, diversity, and abundance, the extent of coral damage and disease, the status of fish stocks (including conch and lobster), fish migration patterns, the existence of nursery areas, algae cover, water quality, the state of the villages' soak-aways, the impact of deforestation on erosion and siltation, and the level and impact of poaching. This requires drawing on and developing technical expertise in data collection as well as taking advantage of the traditional and local ecological knowledge that has accumulated over the lifetimes (and generations) of villagers working on and understanding the land and the sea.

Christie and White (1997, 168) state that traditional knowledge is sometimes ignored by researchers and decision-makers because "its discovery and analysis require in-depth sociological, economic, and anthropological observations which often are difficult and time-consuming." Nevertheless, the benefits of its consideration are substantial: villagers may feel valued and proud that they are able to contribute and that they are helping to shape policy and management initiatives. This, in turn, may lead these stakeholders to be more active participants and be more willing to accept the changes that tend to come with the establishment and proper management of marine protected areas. This is especially important in Speyside where boundaries include an area that is currently used by fishers, the village, itself, and the forests that surround the village and watershed. It should also be remembered that there is as much to learn from community members as there is from the researchers.

Incorporating traditional or local knowledge may also help to reduce redundancy in research. Closer collaboration with locals, NGOs, and government departments and divisions in Tobago could help reduce the amount of overlap that occurs in both research and data collection. For example, Environment TOBAGO has been conducting water quality tests in both Buccoo and Speyside areas. The NGO and the government should share both the results and the actual data collection process. This could potentially lead to more people being informed and fewer people needed to collect similar, if not the same, data. The information that is collected, whether it be concerning water quality or the state of the area's fish stocks, should be disseminated and explained to the stakeholders. Furthermore, as information becomes available, it should be used to help direct decision-making and management in a timely fashion.

An interpretive centre could be a viable mechanism to help inform community members and visitors alike about the state of the environment. At the same time, there has been some concern that locals may not consider the centre to be pertinent to them and that it is instead a place for tourists to frequent. If this perspective does in fact exist in communities, it must change. The centre should be a site for not just exhibits, but also a place to hold meetings, show movies, and house the formal Marine Park management offices.

It should be noted that community and research do not occur during one specific phase of the management framework. Rather, it is on-going and one that must be initiated at the beginning of the process. After this foundation has been established, more direct management initiatives can be implemented – beginning with the creation of management groups.

Gilman (1997) and Jorge (1997) maintain that participation allows for the nurturing of a sense of ownership over resources and protected areas, the prevention of alienation, the permission of multiple uses (although only of those that are consistent with the objectives of the MPA), the reflection of opinions and needs of all interest groups, the creation of flexibility and equity, the reduction of conflict, the connection between “participants or promoters, whose goal is conservation of biodiversity, and local resource users whose goal is well-being for themselves and their families” (Jorge, 1997, 50), and it accounts for differences in power. These are, of course, only *potential* benefits – they are not guaranteed. Whether such benefits are actually realised depends on whether and how stakeholders are organised into working groups, how these groups are facilitated, and whether they are legitimised by the government through the involvement of state representatives who are capable of making final decisions. Indeed, this latter characteristic holds true for all representatives.

Community members who were involved with BRAG may have considered the Group as their own, however it is questionable as to whether they had a strong sense of their power and ability to elicit *real* change. It was an organisation that was fuelled and driven by the efforts of the facilitators rather than the individual members – this is a mistake that should not be repeated in future endeavours.

When community/stakeholder representatives join working groups established to help manage the MPAs, they must do so in good faith. That is, they must be willing to invest their time and effort, attend meetings, take responsibility for implementing decisions, be willing to compromise on certain positions, and to work with other who they may not necessarily like or always agree with – and this must be done with little to no monetary compensation. It is critical that the process does not become politicised. It is not about winning votes or creating an election platform, but rather about the conservation and wise use of fragile natural environments.

In order to form working groups, stakeholders must first be identified and should include primary (direct and indirect), external, and secondary stakeholders. Indeed, departmental and divisional integration is just as necessary as private interest group involvement. Involving external stakeholders may seem controversial within a community-based organisation setting. Nonetheless, the involvement of such stakeholders (including landowners, coastal developers, and hoteliers) is necessary – their actions and decisions have tremendous impacts on the villages and the surrounding environments.

After initial identification of direct stakeholders (this could be completed by the Department of Marine Resources and Fisheries or some other agency, for example, the IMA), group meetings between the Department and each individual group should be held to determine values, positions, interests and thoughts on management issues, including but not limited to, boundaries, activities that should be permitted and prohibited within the Marine Park, zonation, user/permit fees, possible livelihood alternatives for those whose activities may be banned or limited², other possible stakeholders who should be included in the process, and finally, any other issues of concern. Larger meetings that involve representatives from each stakeholder group should follow these preliminary meetings. Issues identified during the smaller individual group meetings should be once again discussed and consensus should be

sought; this will not be easy. Disagreements and some conflict should be expected, but participants should persevere – as long as individuals are communicating, progress is being made.

The formation of this larger group marks a shift away from understanding “the relationship between coastal ecosystems, economic growth, and [personal] well being” to increased “capacity to build upon that understanding” (Jorge, 1997, 67). This capacity is generated through participants’ direct involvement in the decision-making process and is furthered when these decisions are actually implemented. In an effort to formalise the working group, the stakeholders should decide on their mandate, the objectives, the group’s name,³ and agree on a plan of action that includes both short- and long-term strategies.

What is eventually agreed to by the working groups should lead to the creation of new management plans for the Buccoo Reef Marine Park and the Speyside Reefs Marine Park. Allowing the groups to take joint responsibility (with government) for developing new management plans, applying for and accessing funding, and implementing projects permits the groups to build and develop their capacity as the stakeholders become familiar with and experience networking, organising, co-ordinating, lobbying, and action (Jorge, 1997). In essence, such experiences give local stakeholders the confidence, “tools and opportunity to articulate their vision for the future of their communities and take an active role in turning that vision into strategies containing specific action” (Jorge, 1997, 67). That this is a long-term process that requires long-term commitments cannot be over-emphasised. Changes and improvements cannot be expected overnight and implementation may not occur directly after decisions have been made.

Calls for more action and less talk were voiced by communities in Buccoo/Bon Accord and Speyside alike. Action, however, cannot take place until there has been discussion, and often not until the funding required to implement the agreed upon projects has been secured (usually from international agencies or private corporations). As much as integrated coastal zone management can be described as *ad hoc* and “learning-by-doing,” there are still certain steps (as outlined above and in a myriad of works – Christie and White [1997], Dahl [1997], Fiske [1992], Gilman [1997], Olsen, Tobey, and Kerr [1997], and Yates [1994]) that must occur before action and results can be expected.

This is perhaps one of the leading reasons as to why BRAG was not sustained. That is, no comprehensive or continued process characterised the Group; there was no concrete form to the Group. This was, in part, due to the Group forming from a research project that had its own mandate and because facilitators who were from *outside* the community (whether through employment or nationality) directed the meetings. Thus, in this new effort, it is important that in order for the working groups to be effective and legitimate in the eyes of the stakeholders, facilitators should be community members who are chosen by the groups themselves. This could be furthered by suggesting that the role of the facilitator be a rotating one – a different stakeholder assumes the responsibility each meeting, thereby ensuring equity and diversity.

After the stakeholder groups in southwest and northeast Tobago have been formalised, a memorandum of understanding between the groups and the Tobago House of Assembly should be

developed. This document will help limit future conflict and disagreement and clarify the roles that the groups have with regards to decision-making, accessing funds, and implementing projects related to the Marine Park.

While decisions regarding the projects and programmes that should be pursued within the Marine Park boundaries should be decided upon by stakeholder representatives, implementation of these initiatives should be the responsibility of individuals, individual stakeholder groups, or small group collaboration. How a project is implemented will influence its results. At the same time, there is no one correct way to institute any activity. Research, networking, and, at times, trial-and-error may be required.

Implementation should be followed by monitoring and evaluation, both of which will help determine the efficacy of the initiatives, help inform future management activities, and help make the necessary adjustments to project implementation. Once again, community members should be an integral part of the process; their skills and knowledge should be used and validated.

While these activities/phases of the management framework have been described as separate entities, many of them occur throughout the entire process and in tandem – for example, education and evaluation work together and feed back into one another. It is this integration that allows for more effective management. At the same time, community participation, on its own, does not ensure the successful management of an MPA. Indeed, it is not a panacea for coastal zone management. Other factors that are critical components of a viable, effective, and efficient management regime, as per Christie and White (1997) include:

1. the use of low and advanced technology (for example, geographic information systems, remote sensing, videography, and photography);
2. coastal impact assessments;
3. increasing capacity of community, governments, and academic institutions;
4. training and infrastructure development that allows for networking and communication;
5. co-ordination of research projects;
6. an integration of social and ecological information;
7. the role and influence of regional and global economic systems on local conditions;
8. gender analysis and valuing women's roles and knowledge; and
9. understanding the relationships among researchers, managers, decision-makers, and coastal inhabitants and users.

The existence of policy to formalise and institutionalise collaboration is also important. Legislation requiring community-based management may not be appropriate for Tobago – at least not yet. Nevertheless, formalising this approach to coastal zone management also legitimises it. Moreover, it could be argued that without such legislation, the level of community involvement that will be sought during a management regime will depend on the views of those in power – at the Assembly, Divisional, and Departmental levels and thus, will be based on political cycles rather than on the needs of both the environment and the community. Environmental management programmes and policies cannot be

applied and be expected to show positive results in the short time frames that politics tends to follow. Indeed, state-introduced environmental action often requires not only long-term commitment, but also an institutional memory that changing governments, with different representatives, party platforms, and priorities tend not to provide. Communities, meanwhile, can provide that needed stability and constancy, but the option for their involvement must be guaranteed and this can only be possible if it is legislated. At the same time, both capacity and confidence in primary stakeholders' ability to influence change (by both the government and the stakeholders, themselves) needs to be increased before any form of co-management will be possible or even seriously considered. Such capacity cannot be built, however, until the stakeholders are given the opportunity to become more involved.

While the process may seem overwhelming, it is important. The strategies that are currently being followed are not sufficient. The coastal environment continues to degrade and unless a dramatic increase in funding and personnel are made available to the Department of Marine Resources and Fisheries or (perhaps more realistically) unless an alternative management strategy is adopted, Buccoo Reef Marine Park will most likely continue to be a protected area only on paper and Speyside (if designated a Marine Park) may suffer the same fate.

Summary

Leopold (1949 c.f. Suzuki and McConnell, 1997, 78) writes that

[c]onservation is a state of harmony between men and land. By land is meant all things on, over, or in the Earth. Harmony with land is like harmony with a friend, you cannot cherish his right hand and chop off his left. That is to say, you cannot love game and hate predators; you cannot conserve the waters and waste the ranges; you cannot build the forest and mine the farm. The land is one organism.

This understanding of the interconnections between environments and ecosystems as well as the integral role that we, as human beings, play within it is a recognition that all life is part of a fine and delicate balance. It is also, however, a balance that we have not been able to achieve because of our preoccupation with control and direction and a failure to completely accept that

The virtue of the universe is wholeness,
It regards all things as equal (Tzu, 1979 c.f. Suzuki and McConnell, 1997, 78).

This idea that there are things on this Earth that are beyond our control and that we are dependent upon is slowly emerging and becoming more widely accepted. Indeed, we are beginning to recognise that the future of our natural resources and areas lies in our abilities to manage our own actions and impacts rather than dominate over those resources and areas, themselves. It is also an acknowledgment of our connection to them.

Van der Ryn and Cowen (1996 c.f. Suzuki and McConnell) write that

[w]e live in two interpenetrating worlds. The first is the living world, which has been forged in an evolutionary period of over four billion years. The second is the world of roads and cities, farms and artefacts, that people have been designing for themselves over the last few millennia. The condition that threatens both worlds – unsustainability – results from a lack of integration between them.

A new management approach that aims to rectify this disconnection and disassociation is integrated coastal zone management. As a management system, ICZM links the terrestrial and marine environments and addresses the impacts of our activities on the state, health, and integrity of the natural environment. It understands that the decisions that we make as individuals have collective consequences and impels co-ordination and co-operation among decision-makers, coastal inhabitants, and coastal resource users. In essence, ICZM recognises that a more holistic management system is required if we are to conserve our coastal ecosystems.

The purpose of this research paper is to examine the potential for a successful integrated coastal zone management system (through the use of marine protected areas and participatory management) in a small tropical island, specifically, Tobago. Whether the potential for this approach is realised is dependent on a number of factors, not the least of which are the political, economic, social, and cultural contexts of the society and/or community. Instituting an ICZM programme with regards to the Buccoo Reef Marine Park and the proposed Speyside Reefs Marine Park would mean replacing the current government-directed, legislative, and enforcement-based system with one that relies more heavily of public involvement as well as linking water- and land-based policies and programmes.

The current state of the island's coastal environment (particularly in the southwest region) indicates that the traditional management approach is lacking and alternative methods are required. As a management system that encourages co-operation, communication, and education and that facilitates capacity-building, trust, and open-mindedness, ICZM is an approach that emphasises process as much as it does results. This is particularly important because it is a long-term initiative – tangible returns for time, effort, and funds committed may not occur for months or even years; they are based on natural and ecological time periods rather than on political cycles. Moreover, an emphasis on flexibility and adaptability allows ICZM to reflect the environment to which it is being applied. That is, the coastal environment, fluid and dynamic in both its essence and relationships, requires a management regime that does not attempt to tame or control it, but rather one that appreciates its complexity and one that can incorporate new ideas, information, and programmes of action as they arise.

As we try to fix our past mistakes and improve our current situation, there will be no easy answers. Moreover, we will have to make difficult choices about the actions that we should take, about what we are willing to give up, and about our priorities as both individuals and a society. The consequences of these decisions – both the positive and the negative – will not only affect our own lives, but those of generations to come and other forms of Earthly life. We should not take our responsibilities lightly. Dealing with the problems that tropical coastal environments and societies are currently being faced with requires new and innovative solutions that are developed by both governments and the stakeholders who rely on these areas for their livelihoods and well-being. Integrated coastal zone management, as applied to marine protected areas, offers one such a solution.

Endnotes

¹ Even in mathematics this paradox exists. It is perhaps best exemplified by fractal geometry – when a broad view is taken of a seemingly chaotic design, there appears to be no repetition or consistency. Upon closer examination, however, of the finer details of the design, clear patterns become evident.

² The issue of alternative livelihoods is a difficult one. The activity that will be most greatly affected by the Marine Park, especially in Speyside, is fishing. It is possible that some fishing techniques will not be allowed within the boundaries. This will mean that fishers may have to use different techniques, catch different species of fish, or seek alternative employment altogether. Alternative employment may mean switching industries entirely, and probably to tourism. Moreover, it may mean giving up self-employment and the pride and sense of freedom that comes with owning a business. The psychological implications of such change are as important to consider as the ecological and environmental impacts. The issue of alternative livelihoods needs to be considered, but this should only be done in conjunction with the interest groups that will be affected. This view is supported by Fiske (1997, 39) who states that “[t]o deny people one of their suite of income-generating strategies will offend their sense of self-reliance and will engender resistance.” Involving stakeholders in the process may not only help to overcome conflict and suspicion, but it also recognises that the area is being used and “[i]n the broadest sense, it means understanding and accommodating how people use the coastline, from recreational to subsistence patterns. And it encompasses not just recognition of the local peoples’ rights to use the areas, but also refers to the ‘why’ and ‘how’ of their use” (Fiske, 1997, 41). Willoughby *et. al.* (2001) examine the issue of alternative livelihoods in the Caribbean context in their technical report, “Opportunities and Constraints for Coastal Livelihoods in the Caribbean.”

³ While the name of the group may seem inconsequential, in reality, it can have much weight. It is important that the group’s name is all-encompassing. Holmes (2002, pers. comm.) notes that the name “Buccoo Reef Action Group” was exclusionary and may have prevented some stakeholders (such as fisherfolk) from becoming more involved. Since fishers, for the most part, do not use the Buccoo Reef complex to actually fish, they may have felt that they had no role to play within the Group. Holmes (2002, pers. comm.) suggests that a more appropriate name may have been “Southwest Marine Environment Group.”

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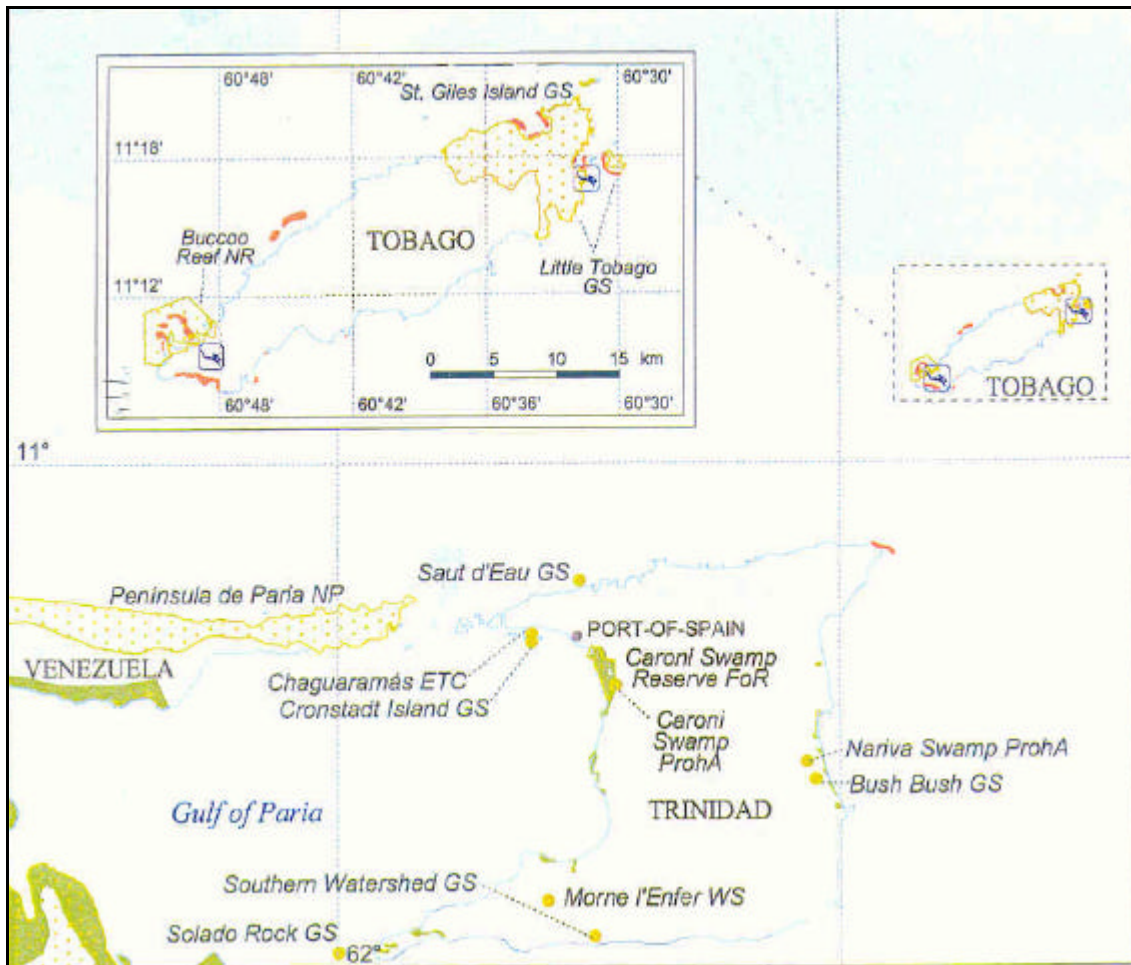
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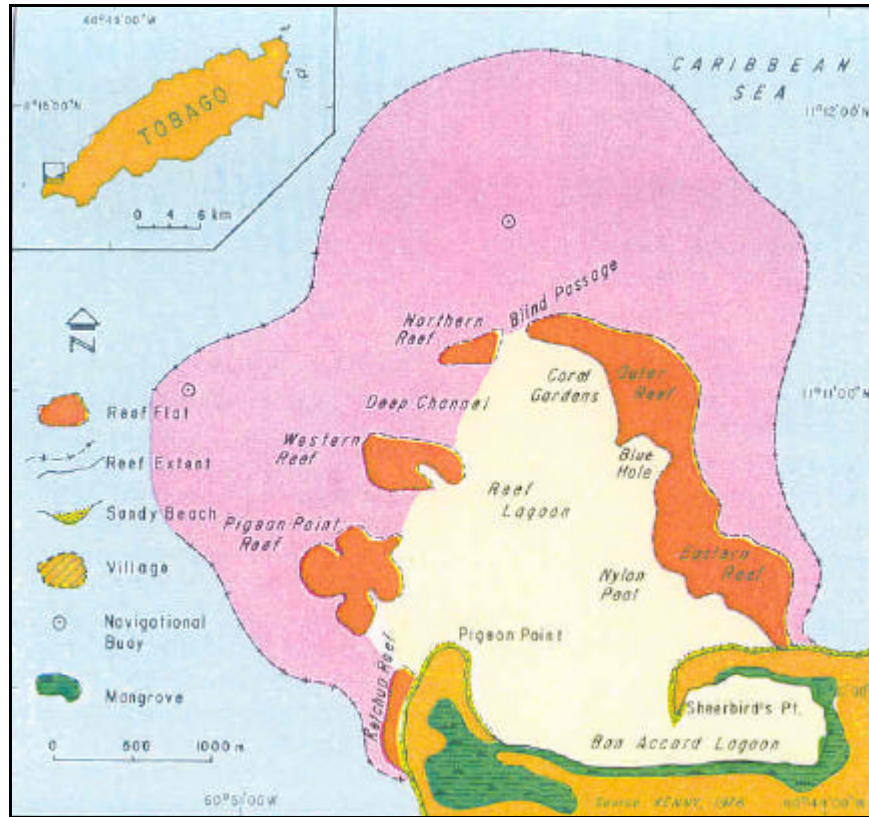
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Appendices

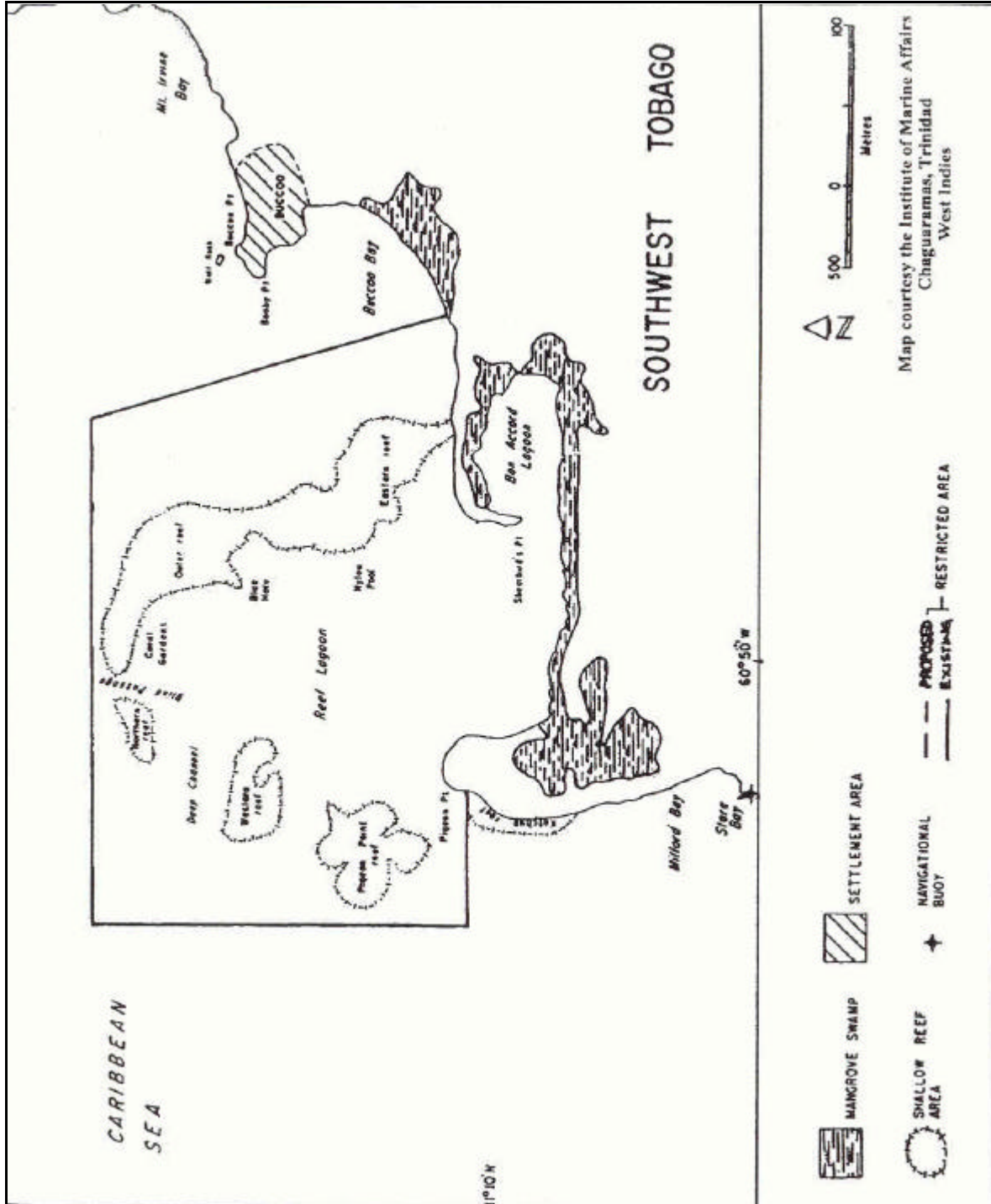
Appendix 1.1. Map of Trinidad and Tobago (Spalding, Ravilious, and Green, 2001, 160)



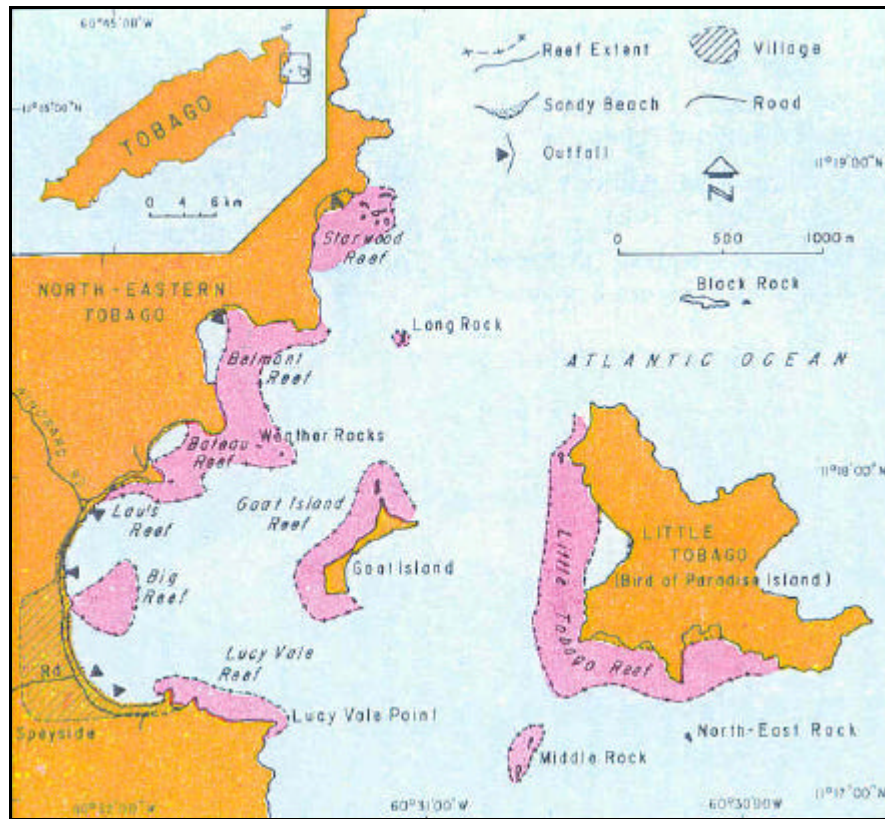
Appendix 1.2. The Buccoo Reef System, Tobago (Laydo, 1991, 32)



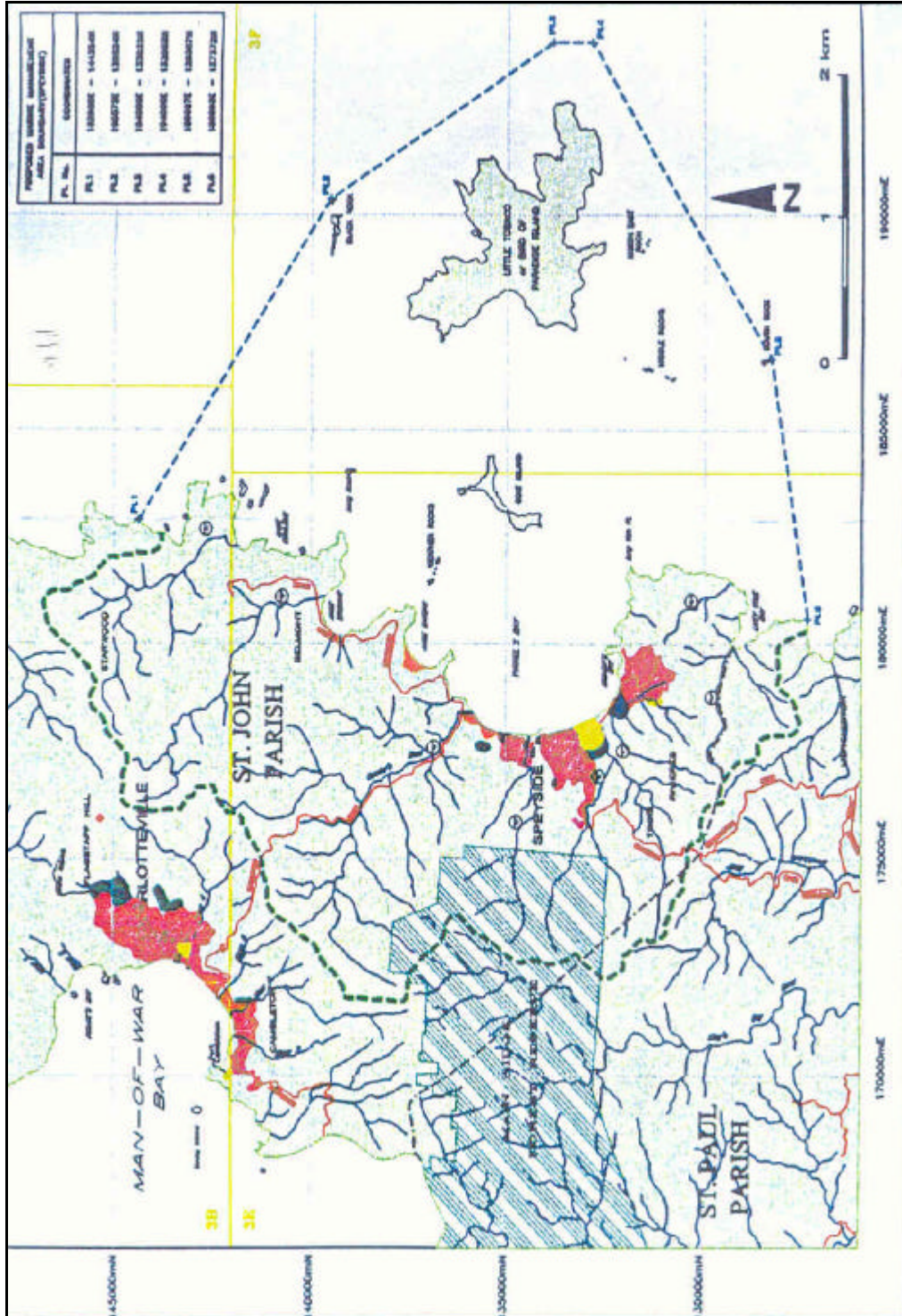
Appendix 1.3. Boundary of the Buccoo Reef Marine Park, Tobago (Institute of Marine Affairs, 1995)



Appendix 1.4. Distribution of Reefs within the Speyside Marine Area (Laydo, 1991, 20)



Appendix 1.5. Boundary of the Proposed Speyside Reefs Marine Park, Tobago (Institute of Marine Affairs, 2001)



Appendix 1.6. Buccoo Reef Marine Park, Tobago Interviewees

Name	Organisation/Institution
C. Alexander	Department of Marine Resources and Fisheries, THA (Agricultural Assistant)
K. Akili	Environment TOBAGO (Former President)
R. de Baer	World Wide Watersports (watersports operator); Tobago Marine Preservation Society (Director)
O. Day	Buccoo Reef Trust
E. John	(dive operator)
Mr. Frank	Reef Tour Operator
M. Frank	Department of Marine Resources and Fisheries, THA (Reef Patrol Officer)
T. Holmes	Department of Marine Resources and Fisheries, THA (Fisheries Extension Officer); Fisherman
R. Layton	Buccoo Reef Trust (Director)
B. Lovelace	Buccoo Reef Trust
T. Melville	Department of Marine Resources and Fisheries, THA (Reef Patrol Officer)
S. Mohammed	Department of Public Works, THA (Consultant)
C. Nero	Reef Tour Operator
D. Peiser	Tobago Life Centres, Director
P. Peiser	Tobago Life Centres, Director
T.A. Pollard	Buccoo Village Council
A. Potts	Department of Marine Resources and Fisheries, THA (Director)
N. Roachford	Reef Tour Operator
K. Sampson	Department of Marine Resources and Fisheries, THA (Dive Officer)
K. Sandy	Department of Marine Resources and Fisheries, THA (Research Officer)
Mr. Trim	Reef Tour Operator
A. Trim	Bon Accord Village Council
H. Waldron	Department of Marine Resources and Fisheries, THA (Reef Patrol Officer)
K. Young	Buccoo Reef Action Group

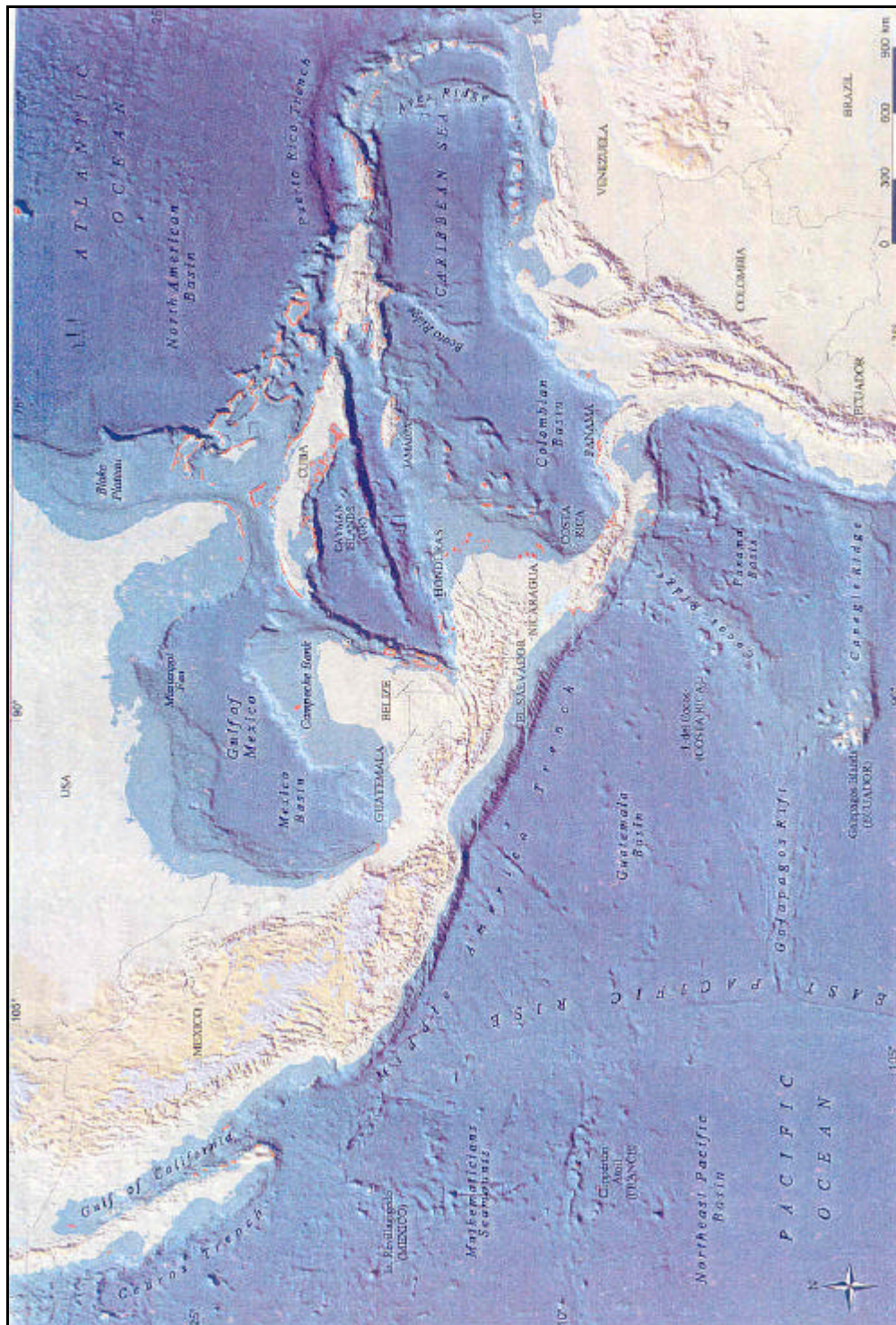
Appendix 1.7. Proposed Speyside Reefs Marine Park, Speyside Interviewees

Rapid rural assessment informants

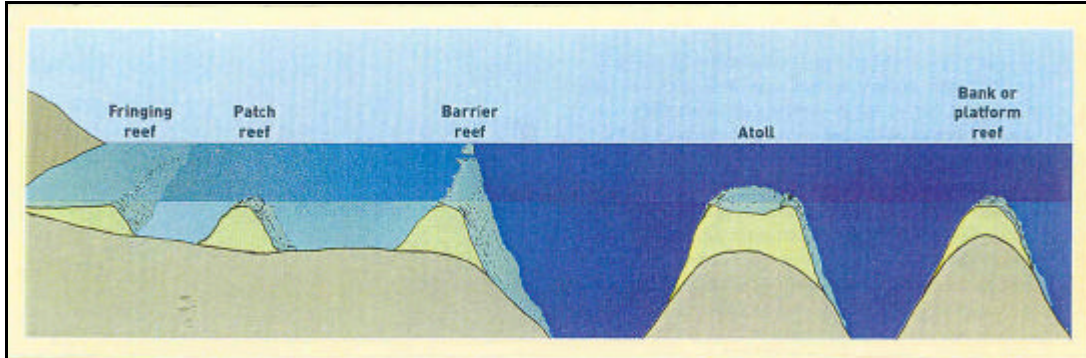
Number	<i>Larger Stakeholder Group</i>	Stakeholder Group Sub-components
28	Livelihood	Dive Operators Fisherfolk Guest House Owners Hoteliers Reef Tour Operators Restaurateurs Shopkeepers and Owners Tradesmen
6	Management	Government Representatives (Department of Public Works, THA and Department of Tourism, THA) Speyside Village Council Representatives
3	Advocacy	Principal Teachers
17	Other	Community Members Life Guards Sanitation Workers Visitors

Speyside Community Meeting (13 June 2002)
Total number of registered attendants: 26

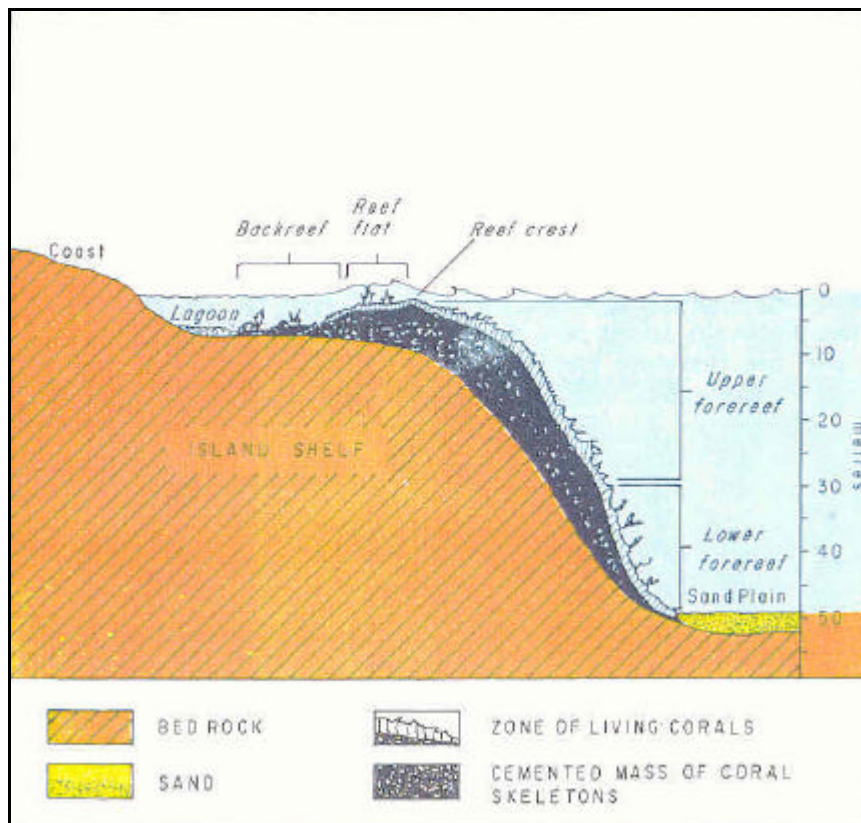
Appendix 2.1. Map of the Wider Caribbean (Spalding, Ravillious, and Green, 2001, 111)



Appendix 2.2. Principal Types of Coral Reef Structure (Spalding, Ravilious, and Green, 2001, 16)



Appendix 2.3. A Cross-Section of a Typical Fringing Reef (Laydo, 1991, 6)



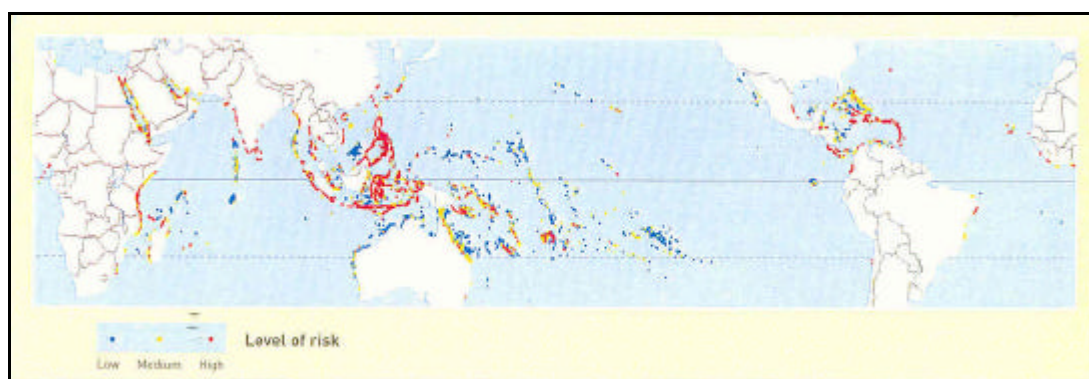
Appendix 2.4. Global Distribution of Reef-Building Corals (Spalding, Ravilious, and Green, 2001, 18)



Appendix 2.5. Global Patterns of Diversity in Reef-Building Corals (Spalding, Ravilious, and Green, 2001, 19)



Appendix 2.6. Reefs at Risk (Spalding, Ravilious, and Green, 2001, 64)



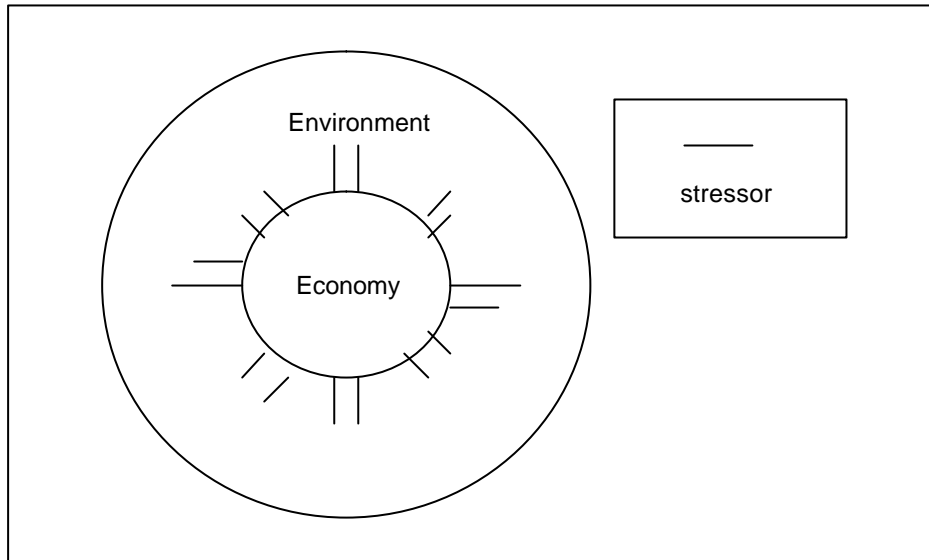
Appendix 2.7. Statistics Concerning Reefs at Risk (Spalding, Ravilious, and Green, 2001, 65)

Region	Proportion of reef area at different levels of risk (%)		
	Low	Medium	High
Middle East	39	46	15
Caribbean	39	32	29
Atlantic (excl. Caribbean)	13	32	55
Indian Ocean	46	29	25
Southeast Asia	18	26	56
Pacific	59	31	10
Global total	42	31	27

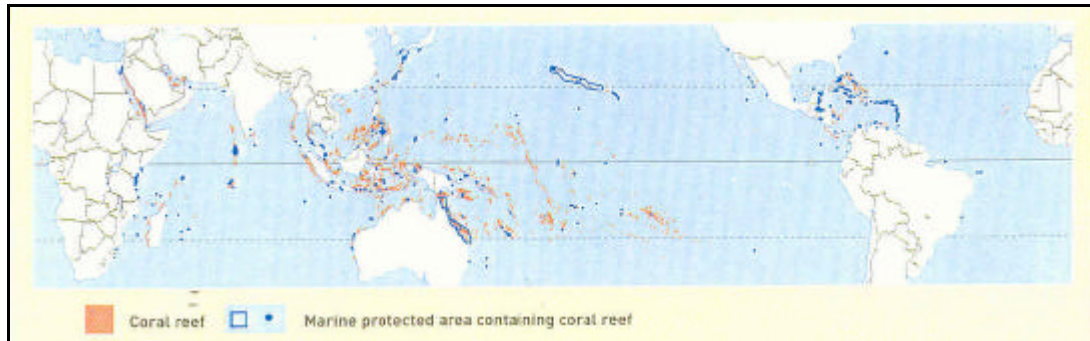
Appendix 2.8. The Evolution of Coastal Zone Management – from the late 1960s to the 1990s (Vallega, 1999, 10)

Stage	Objective	Coastal uses under management	Geographical coverage
Late 1960s: pre-take off	Use management facing a single environmental issue socially perceived as important	One or a few uses (for example, seaports and recreational uses)	<ul style="list-style-type: none"> the shoreline
1970s: take off	Use management and environmental protection	A few uses (for example, seaports, manufacturing plants, recreational uses, and fishing)	<ul style="list-style-type: none"> the shoreline a coastal zone delimited according to arbitrary criteria identification, according to administrative criteria
1980s: drive to maturity	Use management and environmental protection	As an orientation, the whole range of uses	<ul style="list-style-type: none"> as above, seawards tending to manage national jurisdictional zones
1990s: maturity	Integrated management	Comprehensive use management – the management of the coastal ecosystem	<ul style="list-style-type: none"> coverage delimited – land word, according to various criteria and seaward, with reference to the extent of the widest national jurisdictional zone

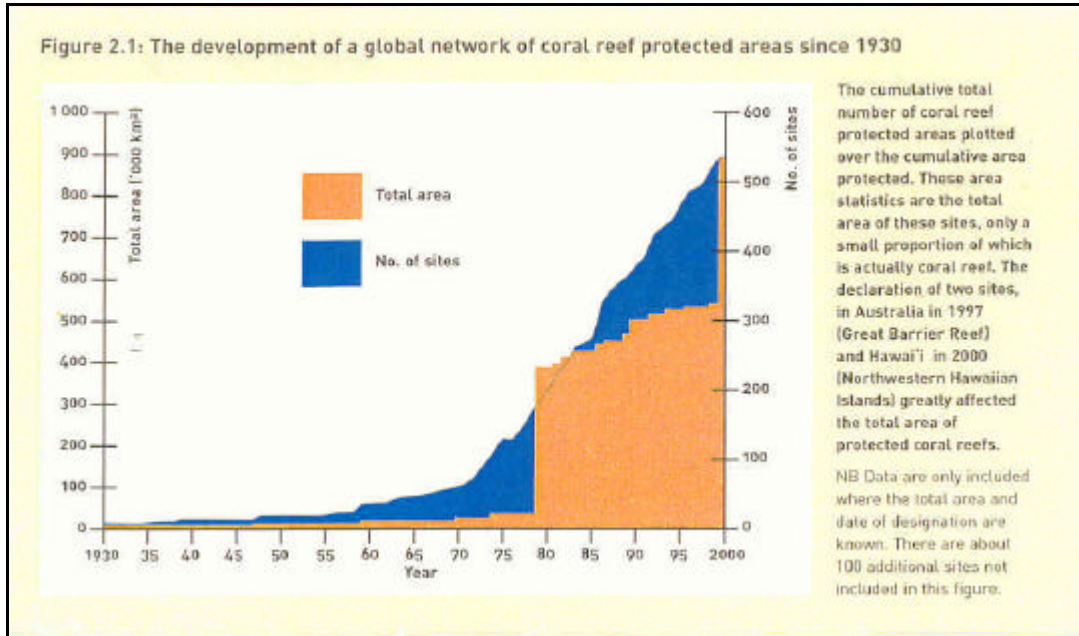
Appendix 2.9. The Relationship between the Environment and the Economy



Appendix 2.10. Global Distribution of Marine Protected Areas that Contain Coral Reefs (Spalding, Ravilious, and Green, 2001, 70)



Appendix 2.11. The Development of a Global Network of Coral Reef Protected Areas (Spalding, Ravilious, and Green, 2001, 72)



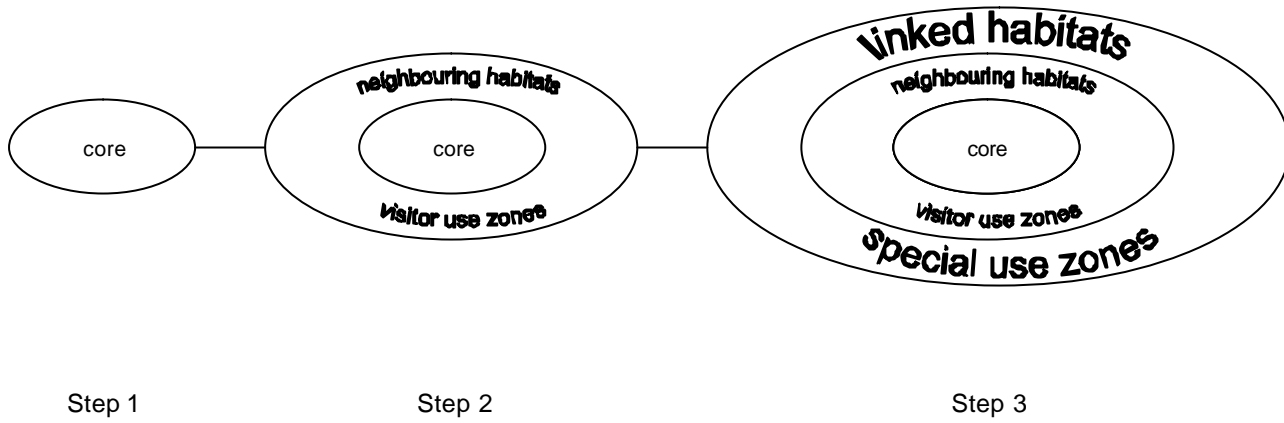
Appendix 2.12. Marine Protected Areas in the Wider Caribbean (Kelleher, Bleakley, and Wells, 1995, 18)

Area	Protected Areas with Coral Reefs
Antigua and Barbuda	5
Anguilla	4
Aruba	-
Bahamas	6
Barbados	1
Belize	11
Cayman Islands	21
Colombia	7
Costa Rica	11
Cuba	15
Dominica	2
Dominican Republic	6
El Salvador	-
Guadeloupe	6
Guatemala	-
Haiti	-
Honduras	17
Jamaica	6
Martinique	4
Mexico	22
Montserrat	-
Navassa Island	-
Netherlands Antilles (Windward and Leeward)	5
Nicaragua	1
Panama	4
Puerto Rico	6
Saint Kitts and Nevis	1
Saint Lucia	16
Saint Vincent and the Grenadines	5
Trinidad and Tobago	1
Turks and Caicos	5
United States	11
Venezuela	6
Virgin Islands (U.K.)	16
Virgin Islands (U.S.)	4
Total	225

Appendix 2.13. Examples of Marine Protected Area Management Objectives (Salm and Clark, 2000, 182)

- To preserve a representative sample of the coral reef ecosystem and a variety of its component and associated habitats, biotic communities and species (biodiversity)
- To protect endangered, depleted, or rare species (for example, hawksbill turtles, giant clams)
- To preserve the ecological processes and support systems on which the integrity of the coral reef ecosystem depends
- To control upstream activities that may damage or destroy all or part of the value of the area for conservation and development
- To promote uses compatible with conservation and sustainable development objectives
- To separate incompatible activities and resolve conflicts among user groups by zoning
- To maintain the social and economic benefits of the area
- To preserve the natural character and scenic value of the site
- To control access to biologically and environmentally sensitive habitats
- To restrict snorkelling and SCUBA diving activities to readily monitored locations
- To prohibit anchoring, poling, and beaching of boats on reefs
- To restrict forms of commercial, recreational, and subsistence fishing to those that cause least physical damage to the environment
- To prevent access by all except surveillance personnel or scientists to certain areas that will function as sanctuaries for valuable or endangered species
- To safeguard the breeding stocks of fishery species for replenishment of depleted areas
- To encourage and facilitate research compatible with the protected area's objectives
- To monitor the effects of all activities in the protected area
- To monitor natural processes and responses to climate change (including bleaching, sea level rise, UV radiation)
- To prevent dredging or other manipulations of the environment and control construction activities within the protected area
- To protect critical sand-binding vegetation on beaches
- To enable successional and other ecological processes and species interactions to continue unimpeded
- To protect ecosystems, biotic communities, and individual species from disturbance or alteration by people
- To regulate all activities inconsistent with the objectives of the protected area
- To enable recuperation of damaged habitats or depleted stocks
- To control access by land, sea, and air
- To facilitate interpretation by special lectures, films, publications, guided tours, and underwater trails
- To secure tenure of necessary land areas to permit siting of essential facilities and to protect sensitive habitats

Appendix 2.14. Steps in the Design of a Coral Reef Protected Area (Salm and Clark, 2000, 174)



Appendix 2.15. Potential Criteria to Consider when Selecting Marine Protected Area Sites
(Kelleher, 1999, 40)

Biogeographic criteria

Presence of rare biogeographic qualities or representative of a biogeographic “type” or types
Existence of unique or unusual geological features

Ecological criteria

Ecological processes or life-support systems (for example, as a source for larvae for downstream areas)
Integrity, or the degree to which the area, either alone or in association with other protected areas, encompasses a complete ecosystem
The variety of habitats
Presence of habitat for rare or endangered species
Presence of nursery or juvenile areas
Presence of feeding, breeding or rest areas
Existence of rare or unique habitat for any species
Degree of genetic diversity within species

Naturalness

Extent to which the area has been protected from, or has not been subject to, human-induced change

Economic importance

Existing or potential economic contribution due to protection (e.g. protection of an area for recreation, subsistence, use by traditional inhabitants, appreciation by tourists and others, or as a refuge nursery area or source of economically important species)

Social importance

Existing or potential value to local, national or international communities because of its heritage, historical, cultural, traditional, aesthetic, educational or recreational qualities

Scientific importance

Value for research and monitoring

International or national significance

Existence of any national or international designation

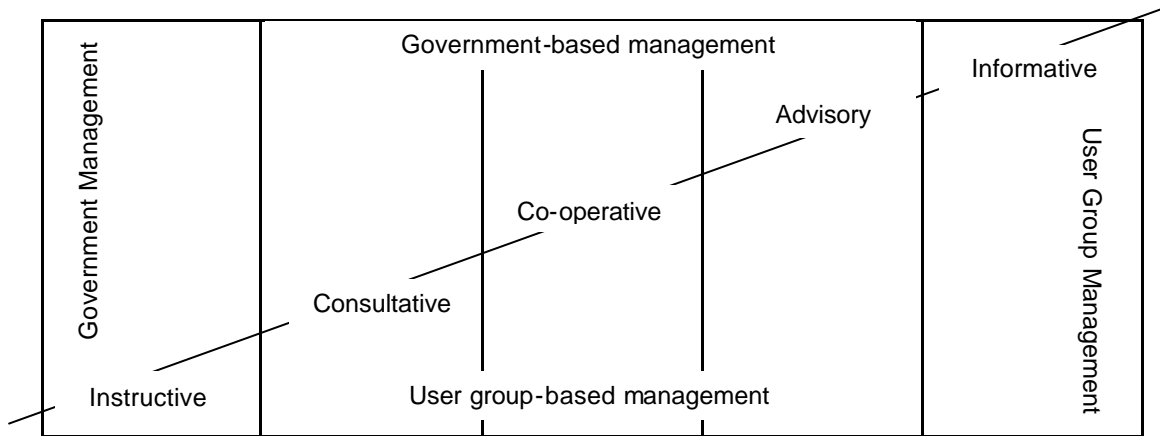
Practicality or feasibility

Degree of insulation from external destructive influences
Social and political acceptability, degree of community support
Accessibility for education, tourism, recreation
Compatibility with existing uses, particularly by locals
Ease of management or compatibility with existing management regimes

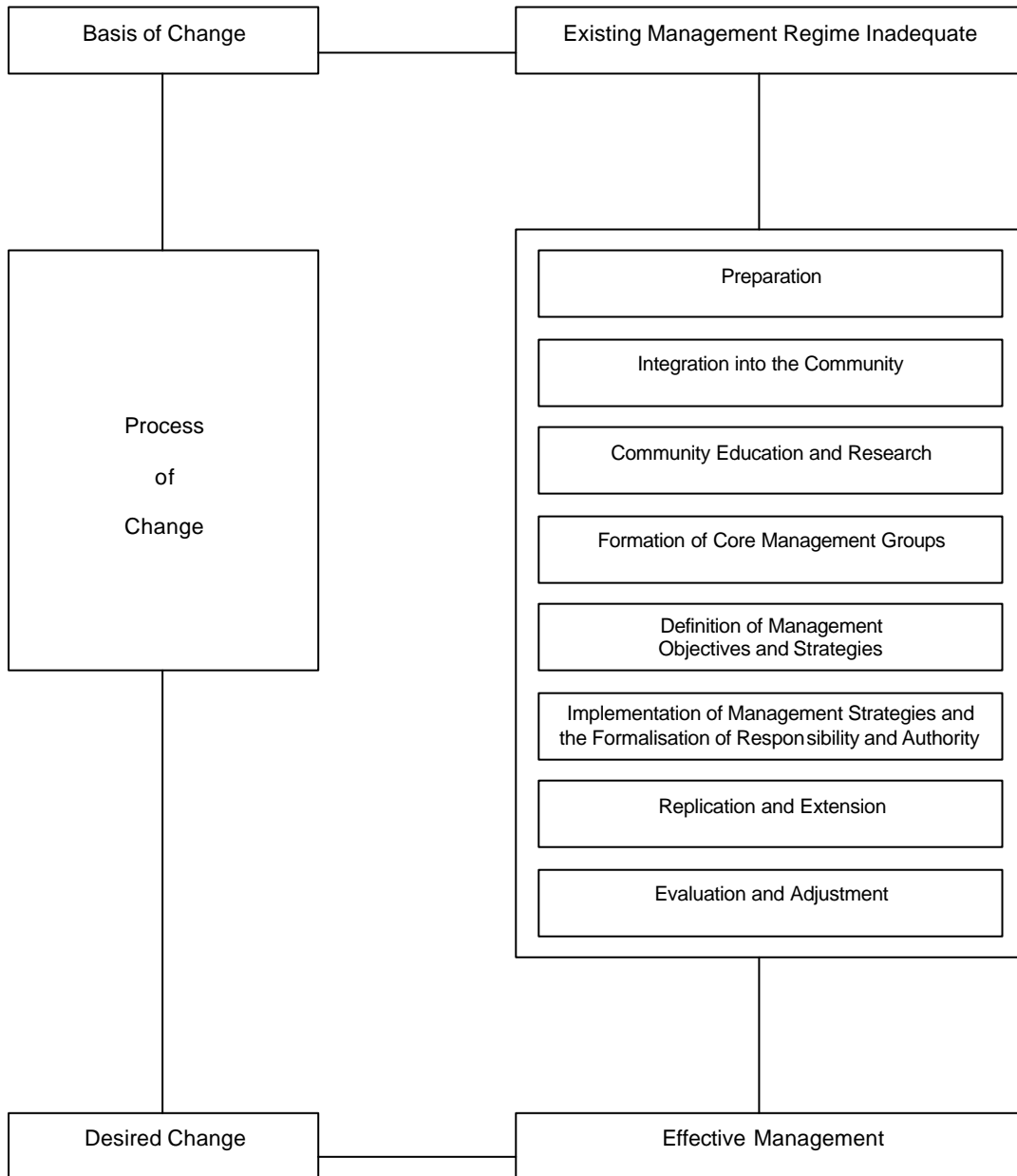
Duality or Replication

MPAs, particularly when small, can be subject to devastating destructive influences, either from humans or from nature, such as cyclones on coral reefs. It is therefore desirable that there should be more than one sample of every major ecosystem type in a representative system.

Appendix 2.16. Co-Management Typologies (Sen, 1998, 15)



Appendix 2.17. A General Framework for the Co-Management of Marine Protected Areas
(White *et. al.*, 1994b, 109)



Appendix 3.1. Fully Managed Marine Protected Areas in the Wider Caribbean (Kelleher, Bleakley, and Wells, 1995, 19)

Subregion	Marine Protected Area
Antillian	
Virgin Islands (U.K.)	Wreck of the Rhone M.P.
Virgin Islands (U.S.)	Virgin Islands National Park Buck Island National Monument
Netherlands Antilles	Saba Underwater Park
Antigua and Barbuda	Nelson's Dockyard National Park
St. Lucia	Maria Islands Nature Reserve
Barbados	Barbados Marine Reserve
Continental	
Colombia	P.N. Corales del Rosario P.N. Tayrona
Netherlands Antilles	Bonaire Underwater Park Curacao Underwater Park
Northwest	
Mexico	Parque Submarino Cozumel Res. Ecologica Isla de Contoy R.B. Sian Ka'an
Cuba	Las Salinas Desembarco del Cranma Pta. Graces-Pta. pedernales
Gulf	
Mexico	Res. Ecologica Rio Lagartos
U.S., Southern Florida	Looe Cay National Marine Sanctuary Key Largo National Marine Sanctuary John Pennekamp State Park Everglades National Park Fort Jefferson National Monument Biscayne National Park Rockery Bay N.E.R.R.
Bahamian	
Bahamas	Exuma Cays Land and Sea Park Inagua National Park Union Creek Reserve
Guianan	
Surinam	Wia Wia Nature Reserve Coppename-Mouth National Reserve Galibi Nature Reserve

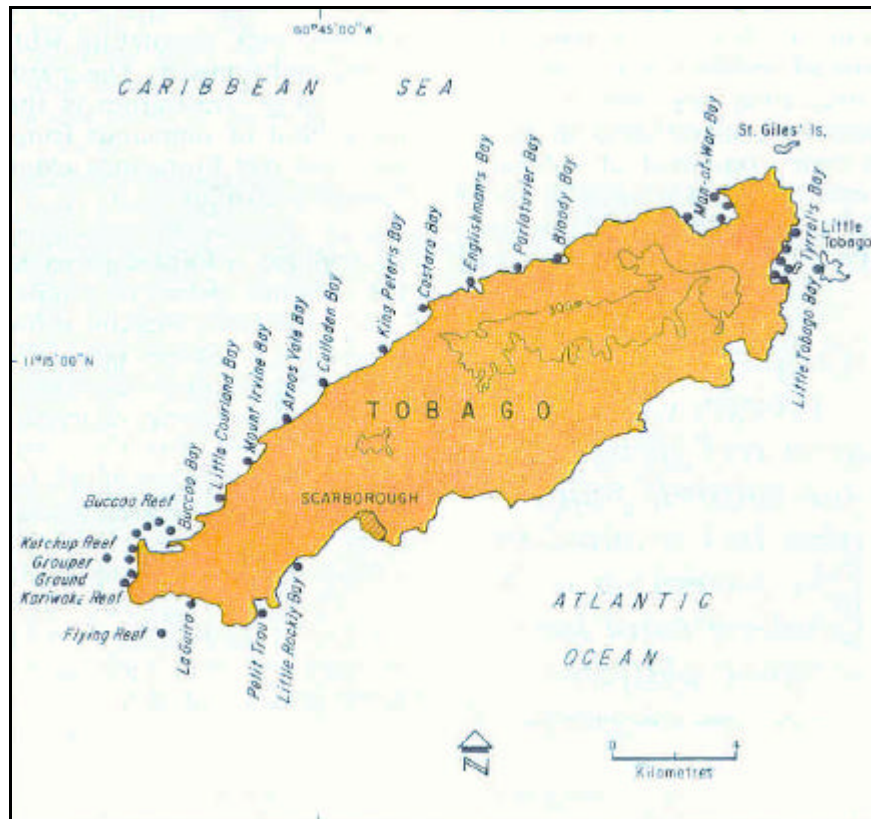
Appendix 3.2. Existing (Partially or Legally) Marine Protected Areas that Require Increased Management in the Wider Caribbean (Kelleher, Bleakley, and Wells, 1995, 26)

Country	Marine Protected Area
Antigua and Barbuda	Palaster Reef Marine National Park Salt Fish tail Reef (Diamond Reef) Marine National Park
Bahamas	Black Sound Cay National Park Conception Island National Park Pelican Cays Land and Sea Park National Park Peterson Cay National Park Union Creek (within Inagua NP) Managed Nature Reserve
Barbados	Barbados Marine Reserve
Belize	Half Moon Caye National Monument
Colombia	Santuario de Fauna y Flora Ciénaga Grande de Santa Marta Reserva Natural Haines Cay to Cotton Cay Parque Nacional Natural Isla de Salamanca Santuario de Fauna y Flora Los Flamencos
Costa Rica	Refugio de Vida Silvestre Barra del Colorado Parque Nacional Cahuita Parque Nacional Tortuguero Refugio Nacional Vida Silvestre Condocha Manzanillo
Cuba	Baconao Parque nacional Marino bahia del Naranjo Cayo Blanco de Casilda Parque Nacional Marino Cayo Caguama Reserva Florística Manejada Cayo Caguanes/Cayos de Piedra Raque Natural Cayo Romano Area Natural Turística Cayo Saetia Refugio de Fauna Cayos de Ana Maria Delta de Canto La Isleta-Nuevas Grandes Península Guanahacabibes Parque Natural Sur Isla de la Juventud
Dominica	Soufriere Scott's Head Marine Reserve
Dominican Republic	Santuario de Fauna Banco de la Plata Reserva Científica Natural Lagunas Redonda y Limon Parque Nacional Los Haitises Parque Nacional del Este Parque Nacional Jaragua Parque Nacional Submarino La Caleta

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Country	Marine Protected Area
Dominican Republic cont'd	Parque Nacional Monte Cristi
Guadeloupe	Reserve Naturelle du Grand Cul de Sac Martin
Guatemala	Biotopo Punta de Manabique
Hondura	Biosphere Reserve Rio Platano Parque Nacional Marino Turtle Harbor
Jamaica	Middle Morant Cay NR/SciR Nature Reserve
Martinique	Caravelle Littoral Conservation Area
Mexico	Reserva Especial de la Biosfera Ria Celestun Reserva Fauna El Garrafon Reserva Marina La Blanquilla
Panama	Comarca Indigena Kuna Yala (San Blas) Parque Nacional Portobelo
Puerto Rico	Reserva Natural Estuarina Nacional Bahia Jobos
St. Lucia	Maria Islands NR Soufriere Marine Management Area
St. Vincent and the Grenadines	Tobago Cays Marine Park
Trinidad and Tobago	Buccoo Reef Marine Park
Venezuela	Parque Nacional Archipelago Los Roques Parque Nacional Laguna de la Restinga Refugio de Fauna Silvestre Isla de Aves Parque Nacional Laguna de Tacarigua Parque Nacional Mochima Parque Nacional Morrocoy

Appendix 3.3. Major Coral Reef Sites Around Tobago (Laydoo, 1991, 18)

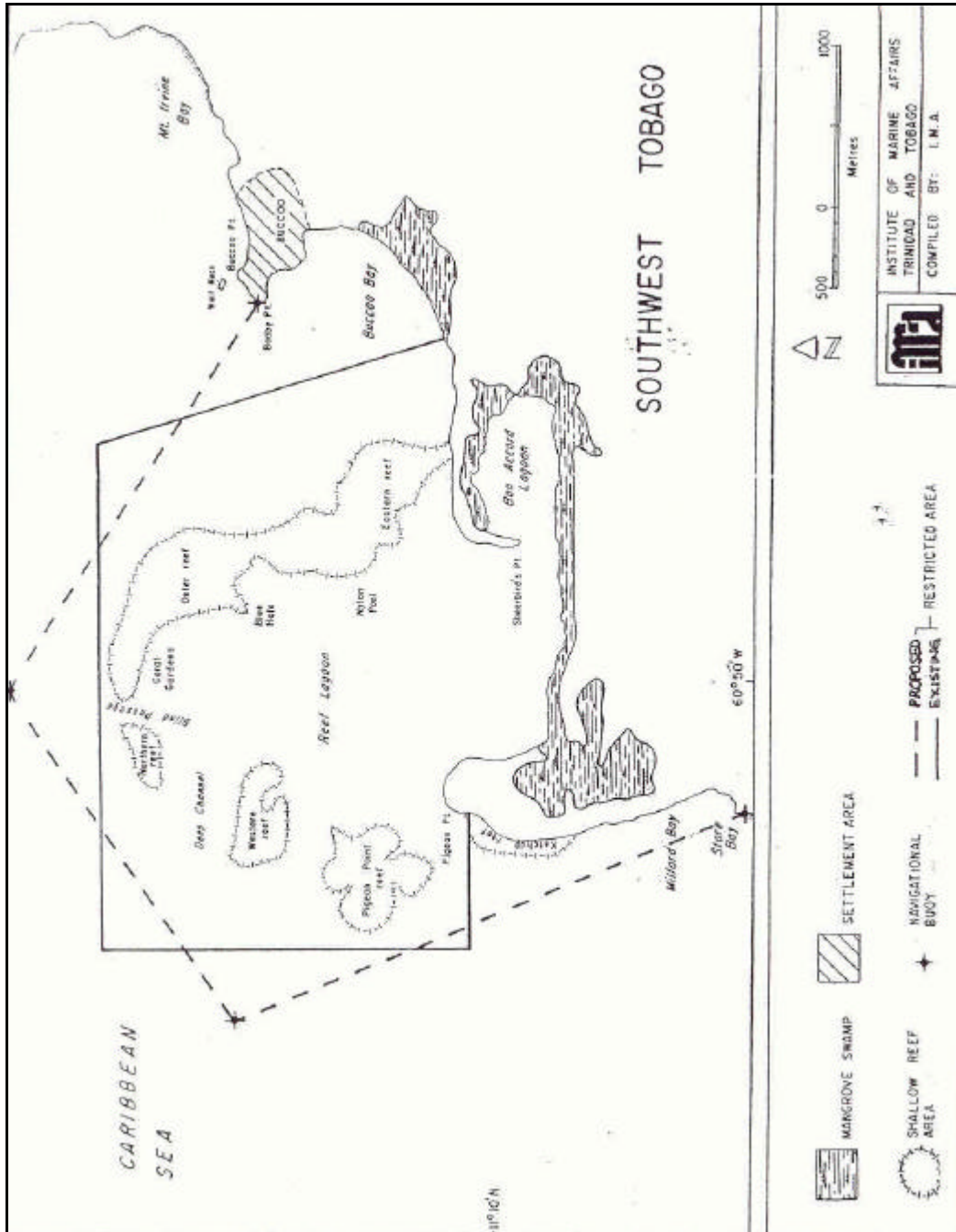


Appendix 3.4. Beachfront Development at Pigeon Point, Tobago (photographs by C. Alexander, 2002)





Appendix 3.5. Proposed Extended Boundary of the Buccoo Reef Marine Park, Tobago (Institute of Marine Affairs, 1995)

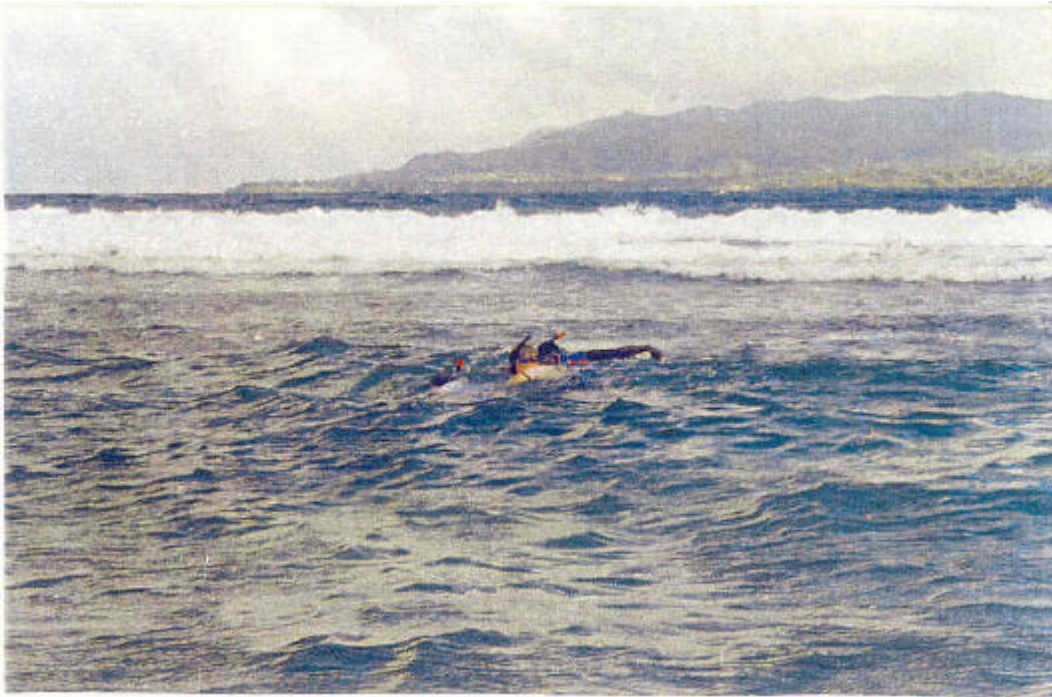


Appendix 3.6. Recommended Additions to Section 6 of the Regulations Regarding the Marine Areas (Preservation and Enhancement) Act (Institute of Marine Affairs, 1995, 29)

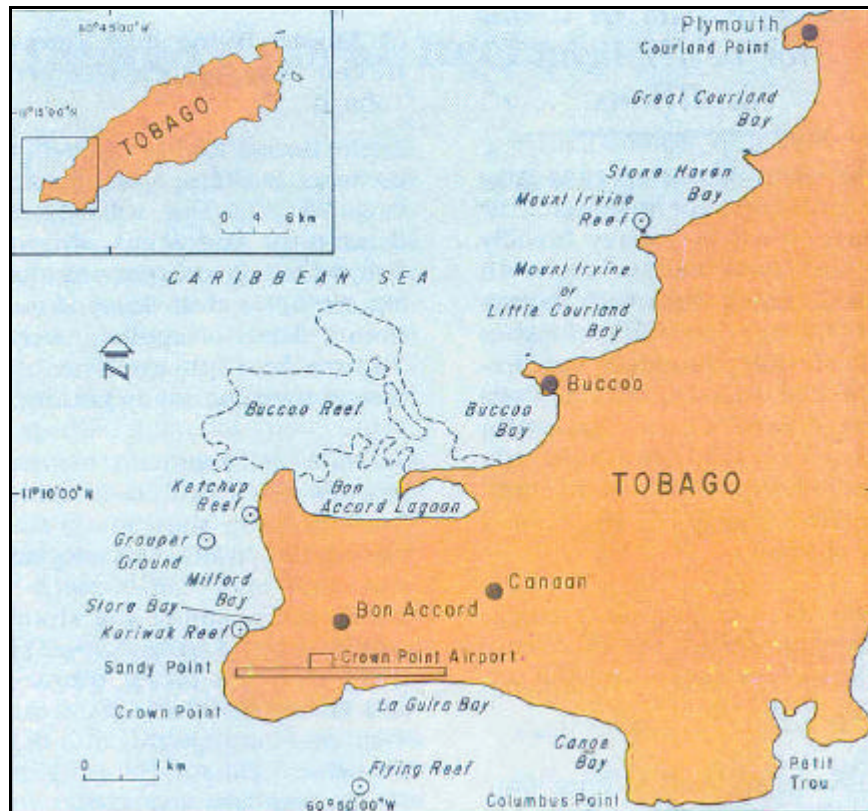
1. Prohibiting dumping, littering or polluting, including the discharging or depositing of any refuse, oily liquids, waste acids, deleterious chemicals or any toxic polluting substances of any kind injurious to plant or animal life in the proposed Marine Park;
2. Limiting the number and size of boats that should be visiting the reef at any one time;
3. Prohibiting the taking, harming, injuring or killing of marine life;
4. Prohibiting the use of spear guns and other fishing methods;
5. Ensuring public rights of way over private property to allow access to the proposed marine Park and other marine areas that may be designated restricted or protected areas;
6. Prohibiting the damage of corals by any means;
7. Prohibiting the mining of material within the proposed marine Park and the trading of such material;
8. Prohibiting the removal or destroying the natural features of the proposed Marine Park;
9. Prohibiting dredging, filling and excavating within the proposed Marine Park;
10. Prohibiting the export of marine animals and plants;
11. Prohibiting the possession of and/or discharge of any rifle or other firearm, spring gun, bang stick, spear gun, harpoon, or other weapons harmful to fish or wildlife, reef structure and dangerous to human safety in the proposed Marine Park; and
12. Prohibiting the possession of explosives in the proposed Marine Park.

Appendix 3.7. Reef Walking on the Buccoo Reef Complex, Tobago (photographs by the author, 2000).





Appendix 3.8. Map of Southwest Tobago (Laydoo, 1991, 35)



Appendix 4.1. Reef Tour Advertisements in Speyside, Tobago (photographs by the author, 2002)





Appendix 4.2. Built Structures on Speyside, Tobago's Shoreline (photographs by the author, 2002)





Appendix 4.3. The Proposed Speyside Reefs Marine Park, Tobago (photographs by the author, 2002)







Appendix 4.4. A Guideline for Semi-Structured Interviews Regarding the Proposed Speyside Reefs Marine Park, Tobago.

1. Introduction of the research team
2. Knowledge of the visit
 - a. did you hear about our visit?
 - i. where/how did you hear about it?
3. Information about the informant
 - a. where do you live?
 - b. how long have you been living in the area?
 - c. position within the community (employment and number of years)
 - d. level of education (optional)
4. Speyside's environmental condition
 - a. knowledge of the reef (state, use, etc.)
 - b. benefits of the reef to the community
 - c. problems (human-induced, natural) that may be affecting the Speyside marine area
5. The Speyside Reefs Marine Park
 - a. knowledge/awareness of plans to create the SRMP
 - b. previous involvement with the creation of the SRMP draft management plan
 - c. impact that the SRMP will have on the area
 - i. potential costs
how do you think the creation of the SRMP will affect your livelihood? Your community? Your attitude?
 - ii. potential benefits
 - d. who will be affected by the SRMP?
6. Community/stakeholder role in the SRMP management
 - a. activities in the area that should be permitted or prohibited (for example, swimming, snorkelling, diving, fishing [boat, spear-fishing, fish potting], reef tours, jet skiing, water skiing, windsurfing, parasailing, other watersports, anchoring, other)
 - b. level of acceptance of a user fee system for
 - i. anchoring
 - ii. diving
 - iii. reef tours
 - iv. watersports
 - v. fishing
 - vi. other
 - c. existing community groups/organisations
 - i. what are these organisations?
 - ii. are you involved in any of these organisations?
 - iii. do you know whether any of the organisations you were/are involved with were consulted about the creation of the SRMP (for example, by the IMA)?
 - d. should community members be involved in the management of the area?
 - i. personal level of interest in being involved in management?
 - ii. what role should stakeholders play in management?
 - iii. what role should community organisations play in management?
 - iv. willingness to serve on an Advisory Board?

7. Do you have any concerns, questions, or issues that you would like to raise?

8. Other comments

Appendix 4.5. Results of the Rapid Rural Assessment of the Village of Speyside, Tobago.

1. Profile of Informants

54 people in Speyside were interviewed.

a. gender profile

Of the 54 people interviewed, 42 were male and 12 were female.

b. age distribution

Persons interviewed ranged from those in their 20s to those in their late 60s or early 70s. The age group predominantly interviewed were those in their 30s.

Age	Number of Informants
1-10	0
11-20	0
21-30	7
31-40	18
41-50	15
>50	6
Total	54

c. village

The informants included those who live and work in Speyside, those who work in Speyside but live in other villages, and those who were visiting the area.

Informant's Village	Number of Informants
Speyside	45
Charlotteville	2
Other	7
Total	54

d. role of the informants within the community of Speyside

Number of Informants	<i>Larger Stakeholder Group</i>	Stakeholder Group Sub-components
28	Livelihood	Dive Operators Fisherfolk Guest House Owners Hoteliers Reef Tour Operators Restaurateurs Shopkeepers and Owners Tradesmen
6	Management	Government Representatives (Department of Public Works, THA and Department of Tourism, THA) Speyside Village Council Representatives
3	Advocacy	Principal Teachers
17	Other	Community Members Life Guards Sanitation Workers Visitors

2. Informants' knowledge about the Speyside Reefs Area

a. information (knowledge of the state of the reefs)

The majority (46.3%) of the informants were knowledgeable of the state of the Speyside Reefs system (and basic coastal/marine ecology). 18.5% of persons interviewed had some knowledge of the reef area, while 18.5% were not aware of the state of the reefs. The level of knowledge of the reef could not be assessed for 16.7% of those interviewed.

b. issues identified by the informants as activities that may be damaging the reefs include:

- land-based pollution (in the form of sewage, garbage/litter)
- yachts emptying their septic tanks into the water
- anchoring of boats on the reefs

Level of Information	Number of Informants
Very Knowledgeable	25
Some Knowledge	20

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No Knowledge	20
Unknown	9
Total	54

c. awareness (of the proposed SRMP)

Of the 54 people interviewed, 59.3% were aware of plans for the establishment of the SRMP (40.7% were unaware of the plans).

Awareness of Plans for the SRMP	Number of Informants
Yes	32
No	15
Unknown	7
Total	54

d. acceptance (of the proposed SRMP)

When asked whether they supported plans to create the SRMP, a resounding majority of 90.1% voiced their acceptance. 0.06% stated that they did not support its establishment. The level of acceptance for the marine park was not established for 9.84% of the informants.

Acceptance of the Proposed SRMP	Number of Informants
Yes	49
No	3
Unknown	2
Total	54

3. Informants' opinions on the proposed SRMP

a. negative impacts on Speyside should the SRMP be created

57% of the informants indicated that the creation of the SRMP would lead to negative impacts on Speyside and community members. These negative impacts were social and economic in nature. Those identified included:

- a belief that only those who are already benefiting from the area will continue to benefit, while others who are already disadvantaged will remain so

- a loss of employment – primarily in the fisheries sector since fishermen may no longer be able to fish in the area (although this may extend to include those who harvest conch and lobster in the area)
- concern that the establishment of the marine park may encourage further large-scale development (in the form of large hotels) in the area
- the size of the boundaries (some informants stated that the proposed boundaries were too large, while others stated that they were not large enough)

b. benefits for Speyside if the SRMP is created

The majority the people interviewed (70.4%) indicated that the SRMP would be a positive contribution to the community of Speyside. Potential benefits included:

- increased protection of the reef system/bay
- increased tourism in the area
- increased employment opportunities
- increased number of people diving in the area
- increased development of the area
- increased awareness of conservation and environmental issues
- Speyside residents feeling proud of their village

c. activities that should be allowed and prohibited within the protected area

Activity	Permitted	Prohibited	No Agreement
Swimming	X		
Snorkelling	X		
Diving			X
Reef Tours	X		
Windsurfing	X		
Jetskiing			X
Sailing	X		
Fishing (with limits)			X
<ul style="list-style-type: none"> • spearfishing • potting • trolling 		X	X

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<ul style="list-style-type: none"> • beach seine • filleting • conch (with limits) • lobster (with limits) 	<p>X</p> <p>X</p>		<p>X</p> <p>X</p> <p>X</p>
Removal of Coral		X	
Anchoring		X	
Removal of Drift Wood	X		
Removal of Shells from the beach	X		

i. activities that did not receive consensus

Activity	Number of Informants in Support	Number of Informants Opposed
Diving	24	1
Jetskiing	1	5
Fishing	15	28
<ul style="list-style-type: none"> • spearfishing • filleting • removal of conch • removal of lobster 	<p>3</p> <p>1</p> <p>8</p> <p>8</p>	<p>15</p> <p>1</p> <p>6</p> <p>6</p>

4. Management

a. user fee system

In an effort to make the proposed SRMP self-financing, the IMA recommended that a user fee system be instituted in the area. Twenty-seven of the 54 people interviewed addressed

this issue. Of these 27 informants, 92.3% (or 25 people) were in favour of the system, while only 0.07% (or 2 people) opposed it. 0.07% (2 people) indicated that a user fee should be applied to only foreigners.

Activity	Number of Informants
Diving	10
Reef Tour	11
Mooring	1
Hotel (tax)	1
Foreigners only	2
Total	25

b. stakeholders' future role

Thirty-three of the 54 informants addressed the issue of management options for the SRMP. Some of the informants indicated a willingness to become involved in managing the area once it has become a protected area. Their level of involvement ranged from formal incorporation into a management body to local consultation. It should be noted, however, that some of the informants stated that the park should remain under complete State control.

Type of Management	Number of Informants
Government	3
Community	3
Government-Community	27
Total	33

5. Issues and concerns

a. state of the reef

Speyside Reefs are in a better condition than Buccoo Reef

- i. creation of the SRMP is to help ensure that negative impacts on the reef are minimised and that the reef can recover from damage already sustained (from anchoring, sewage outflow (land-based and from yachts), diving, snorkelling, and spearfishing
- ii. if the Speyside marine area is in "good condition," why is additional protection needed?

b. Reef patrol

- i. community members want to be trained as marine wardens

- c. zonation and boundaries
 - i. concerns that the boundaries are either too large or too small
 - ii. the area should be zoned
 - iii. certain fishing techniques/activities should be allowed to occur in certain areas within the Park – that is, not all areas should be designated “no-take” zones

- d. alternative livelihoods
 - i. some concerns were raised about the effect of the Marine Park on some villagers – especially the fisherfolk
 - ii. while some understood that their activities may be limited or banned, they were not in complete accord
 - iii. alternative livelihoods that were identified by the informants centred primarily on opportunities created within the tourism industry and Marine Park enforcement

- e. Politics and conflict/tension
 - i. within village council
 - ii. potential for increased tension and conflict between the fishing and tourism industries
 - iii. some informants feared the increased tourism (and potentially large-scale development) that may accompany the establishment of Marine Park – others saw increased tourism and development as positive results

- f. community participation
 - i. the majority of informants stated that there needs to be increased stakeholder involvement
 - ii. they also stated that it is difficult for organisations to be established and to continue – often because of the time and effort required – also a slow process that may not show results right away
 - iii. important that all stakeholders are represented