

TECHNICAL REPORT

ON

Socioeconomic Monitoring in Cades Bay Marine Reserve
Antigua and Barbuda

A Pilot Project Sponsored by

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PROGRAMME DES NATIONS UNIES POUR L'ENVIRONNEMENT • PROGRAMA DE LAS NACIONES UNIDAS PARA EL MEDIO AMBIENTE
ПРОГРАММА ОРГАНИЗАЦИИ ОБЪЕДИНЕННЫХ НАЦИЙ ПО ОКРУЖАЮЩЕЙ СРЕДЕ

**Programa Ambiental del Caribe Caribbean Environment Programme
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Caraibes/

Fisheries Division



Antigua and Barbuda

Preface:

A healthy environment is the primary basis for the economically critical tourism and fishing industries in the Caribbean. However, these industries, coupled with traditional settlement and development activities, are exerting major influences on the complex mixture of sensitive ecosystems that comprise the Caribbean coastal zone. Awareness of the economic and social value of the marine environment and the coastal areas, and acknowledgment of the need to protect and preserve sensitive ecosystems, particularly coral reefs, has led each Caribbean country to establish marine protected areas or reserves. These areas are useful tools, not only for protecting and conserving threatened coastal and marine areas, but also for the direct involvement of local communities in the management and by channelling some of the economic benefits from the tourism industry to the local communities, thereby allowing them to directly benefit from it and creating incentives to preserve the environment.

Poor fishing and land use practices, coastal development, and numerous other threats are increasing the pressures on coral reef health. These threats can be mitigated with appropriate management practices that benefit conservation and management of coral reefs. However, altering practices that are harmful to coral reefs is often difficult because the various ways in which people utilize their natural resources are invariably related to a multitude of social, cultural, and economic factors. Coastal resource managers cannot limit themselves to managing reefs from only a biophysical standpoint, but must include socioeconomic factors. It is essential to understand how stakeholders use and perceive coastal resources prior to attempts to involve local people in community-based or co-management efforts. Gaining an understanding of the socioeconomic factors driving resource use can allow resource managers to identify root causes of resource degradation and adapt management strategies to reflect the needs and desires of the stakeholders.

The findings from socioeconomic monitoring can be used to improve future reef management strategies. Understanding how socioeconomic factors influence resource use can assist resource managers in identifying root causes of environmental problems and help efficaciously apply limited funds by adapting project activities to local conditions. Managers can use the information to demonstrate to the public and policy makers the importance of protecting the natural environment including coral reefs, and to support their actions in planning new management policies.

Acknowledgements

I am grateful to all who assisted in making this project a success. Special thanks are offered to the key informants especially fishermen and householders who were interviewed in Johnsons Point, Urlings and Old Road. Staff of the Fisheries Division are commended for their general support throughout the project.

To the sponsors, UNEP-CAR/RCU and NOAA I am also grateful. They have jointly funded this SocMon study.

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EXECUTIVE SUMMARY

The primary purpose of this socioeconomic assessment is to provide an avenue to demonstrate some of the principles that were the basis of a training course on Social and Economic Monitoring (SocMon) in Marine Protected Areas (MPAs) held in St. Lucia, 9-13 May 2005. The Cades Bay Marine Reserve (CBMR), one of the four established marine reserves of Antigua and Barbuda, is the main study site from which baseline data on the social and economic conditions will be studied. The project is jointly funded by UNEP-CAR/RCU and NOAA.

The project has three (3) focal areas on which specific objectives are based. These are management, monitoring and communication. Most of the primary data were collected through interviews carried out in the three (3) communities, Old Road, Urlings and Johnsons Point, using a household questionnaire. Emphasis was placed on key stakeholders such as fishermen and their activities since the three main communities were traditionally fishing villages. It is evident that fishing is still a major economic activity but all three communities depend on tourism based activities as sources of income.

Major stakeholders are aware of the general operations and principles governing CBMR but most people possess very little related information. However, a high percentage of respondents perceive that the rules and regulations governing MPAs are enforced by the relevant authorities. They would also comply with coastal management rules and regulations within the CBMR area. However, many residents did not participate in or were not involved in making decisions on how the coast including CBMR is managed.

There were mixed results as to the impact of the establishment of CBMR. While most persons rated the condition of the natural resources as average or near average, major users such as fishermen and divers (tourism) paint a bleaker picture. Resource use within CBMR have not really changed since the establishment of the reserve but there are recognised changes in incomes mainly as a result of indirect impacts from tourism development.

A few problems were identified as being associated with the establishment of CBMR. There are however several expectations mainly focusing on the enhancement of the natural environment and the provision of facilities for the improvement of livelihoods.

This study recommends the following general needs:

- The conducting of detailed scientific studies related to the protected area environment
- Upgrading of PAs legislation and improvement of related institutional arrangements
- On-going environmental education and public awareness programmes for PAs.

For CBMR, the following are recommended focal activities:

- An extensive outreach programme to sensitise and inform the relevant communities of the importance of CBMR.
- The formation of a community-based organisation (CBO) to assist in the management and development of CBMR.
- Completion/finalisation of the Management Plan for CBMR.
- Government agencies, such as the Fisheries Division, should continue working with major stakeholders including the communities in maintaining and preserving the natural landscape within CBMR.

The lessons learnt from this study may be used to guide further research on protected areas in Antigua and Barbuda. There is a real need for more SocMon studies throughout the Caribbean.

INTRODUCTION:

It has been recognized, and become increasingly important to include socioeconomic monitoring in monitoring and assessment programmes in the management of marine protected areas in the Wider Caribbean Region (WCR). The inclusion of socioeconomic information will help managers and policy makers make informed decisions relating to the management of coral reefs and other related ecosystems. In order to address the lack of inclusion of socioeconomic monitoring in the monitoring programmes of MPAs in the region, a regional training workshop in socioeconomic monitoring was organized under the capacity building framework of UNEP-CEP and its Regional Coordinating Unit in Jamaica (UNEP-CAR/RCU), in collaboration with the Network and Forum of Marine Protected Areas in the Wider Caribbean (CaMPAM). The workshop was jointly funded by UNEP-CAR/RCU and NOAA.¹

Participants were trained in using "Socioeconomic Monitoring Guidelines for Coastal Managers in the Caribbean."² This included a regional one-week course, as well as local follow-up monitoring activities with the organizations to which the trained managers are attached. Trainees were committed to undertake pilot studies, using the theoretical and practical knowledge of socio-economic monitoring that they have gained. Cades Bay Marine Reserve (CBMR) was the pilot site chosen for Antigua and Barbuda.

BACKGROUND TO STUDY:

Over the last three decades, there have been significant changes in the coastal and marine habitats of Antigua and Barbuda. During this period four (4) marine protected areas were established. Two of these areas, the Diamond Reef/Salt-fish Tail Reef and Palaster Reef,³ are strict reserves focusing on the protection of important coral reef systems off Antigua and Barbuda, respectively. By nature, these areas are restricted only to non-consumptive uses. The other two (2) Marine Protected Area (MPA), Cades Bay Marine Reserve (CBMR)⁴ and the North East Marine Management Area (NEMMA)⁵ were established under the Fisheries Act (1983) for the purpose of monitoring bio-diversity, sustaining fisheries resources and creating interesting marine environment for local communities and the tourist trade. Because of the multiplicity of use in these areas, plans have to be developed to manage conflicts and to ensure that they remain sustainable. The outer boundaries of the CBMR have already been demarcated on its establishment. The general location of the site can be seen in Figure 1. Consultations between the Fisheries Division and major stakeholders are ongoing, especially to determine different use zones. A draft of the proposed zonation is shown in Figure 2. A draft Management Plan was also developed for the area. These preliminary instruments are already used as the basis for guiding development plans within CBMR and adjoining areas.

¹ *Training Course on Social and Economic Monitoring (SocMon) in Marine Protected Areas (MPAs)*, St. Lucia, 9-13 May 2005 (UNEP)

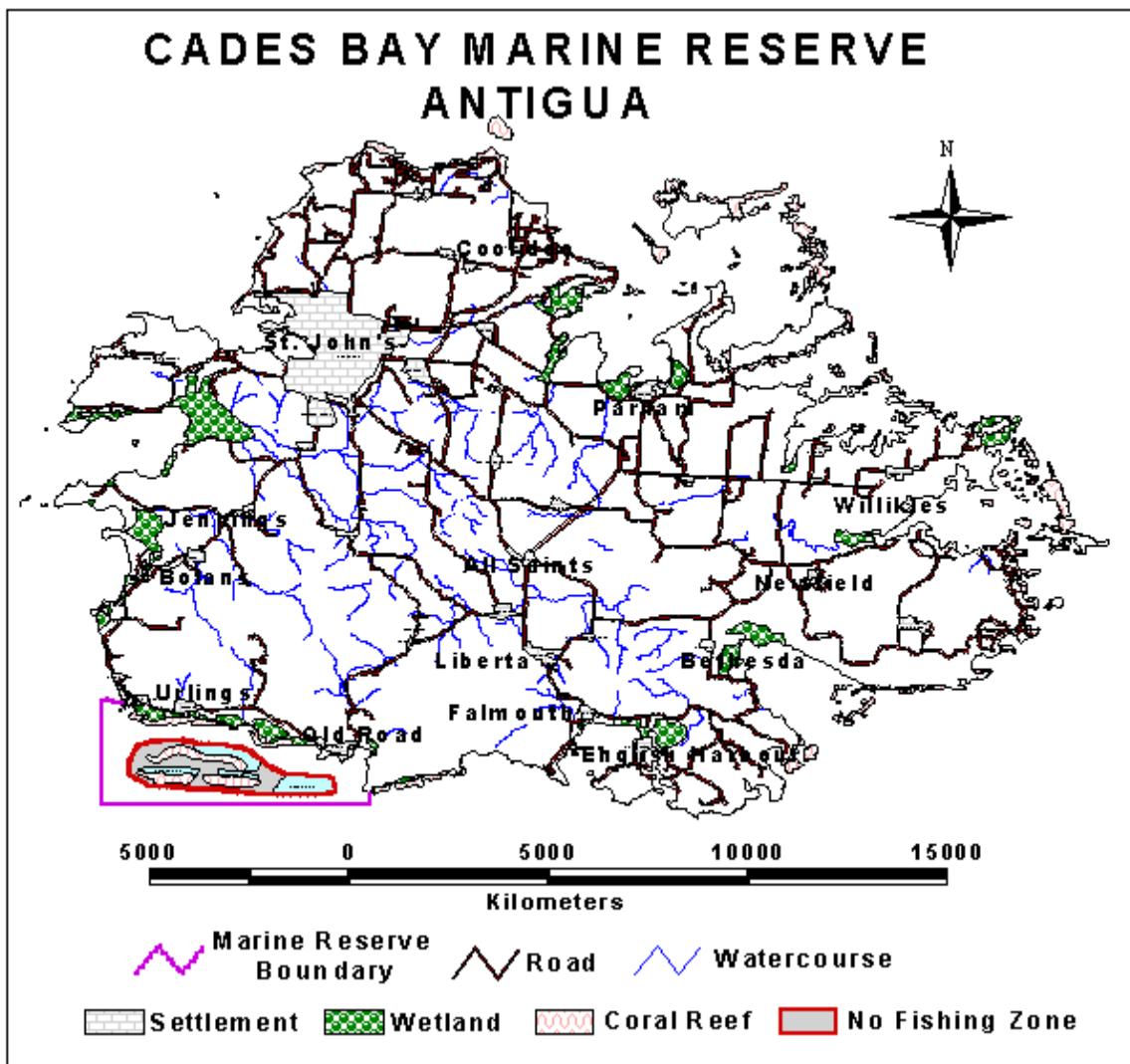
² Bunce, L. and R. Pomeroy. 2003. *Socioeconomic monitoring guidelines for coastal managers in the Caribbean (SocMon Caribbean)*. World Commission on Protected Areas, Gland.

³ Established 1973

⁴ Established 1999

⁵ Established 2005, under the OECS Protected Areas and Associated Livelihoods (OPAAL) project

Figure 1 : Location of Cades Bay Marine Reserve

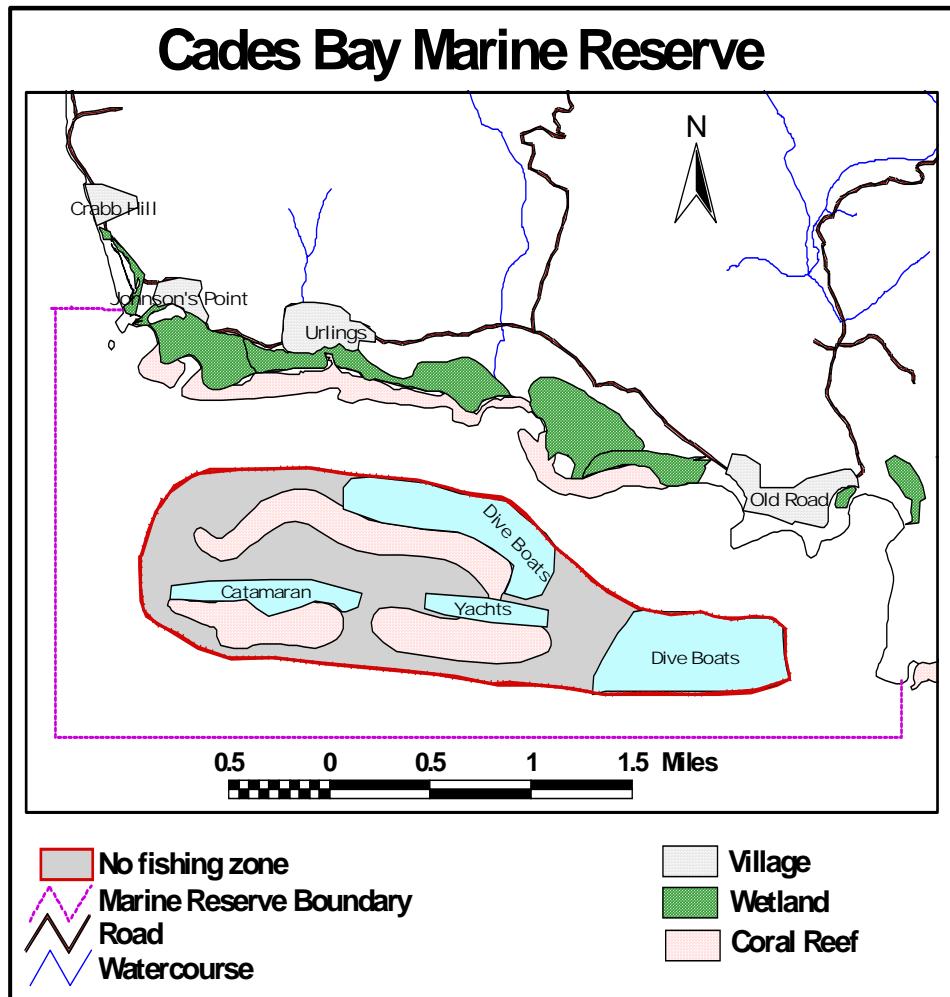


Source: Management Plan for Cades Bay Marine Reserve (2002)

The major habitats including beaches, mangroves, coral reef and sea grass beds, are subjected to various kinds of man-made environmental stress including: sewage and other effluent disposals from coastal populations, sea traffic, agriculture, deforestation, yachting and diving activities, other shore-line alterations and fishing. In addition, the ever-increasing threat of sea level rise and an increase in the frequency and intensity of tropical storms have further compounded the problem. Beneficiaries of this project include fishermen, especially those who fish along the south coast of Antigua; marine tour operators (dive boats, glass bottom boats, catamarans, etc.) who use the area, hoteliers, other users of the area and the general Antiguan public.

Socio-economic monitoring will allow for identification of various users and uses of the MPA, as well as the relative importance of the Cades Bay Marine Reserve to the day to day lives of the primary stakeholders. It will also assist in determining the effectiveness of stakeholders' participation within the management framework of the CBMR.

Figure 2 : Zonation within Cades Bay Marine Reserve



Source: Management Plan for Cades Bay Marine Reserve (2002)

MAJOR GOALS AND OBJECTIVES:

This project has three (3) major goals: management, monitoring and communication. Both the general and specific objectives are stated in Table 1. The main outputs of this activity will provide documentation of socio-economic data on the stakeholders of Cades Bay Marine Reserve including the identification of primary stakeholders, and the level of interest that they have in the reserve and the establishment of social and economic baselines. The natural resources within CBMR, especially their use over time, will also be considered.

The expected outputs and associated activities are given in Annex 1. Annex 2 provides an approximate budget or the relative cost of completing the project.

Originally, this project was scheduled to run from 30 July 2005 to 30 November 2005. Various technical difficulties have caused several delays. As a result some activities were modified and expected outcomes would be different from those anticipated originally.

Table 1 : Project Goals and Objectives

Goal (general objective)	Purposes (specific objectives)
<p>Management:</p> <p>To protect and conserve the resources of CBMR</p> <p>To develop strategies that can be used in other MPAs in Antigua and Barbuda</p>	<p>To assess the perceptions of socio-economic impacts of Stakeholders activities on the coastal and marine environment within Cades Bay Marine Reserve</p> <p>To contribute to the development of a management Plan that ensures that there is equitable distribution of resources to Stakeholders of Cades Bay Marine Reserve.</p>
<p>Monitoring:</p> <p>To detect changes in social and economic conditions within CBMR</p>	<p>To establish social and economic baselines so as to determine levels of changes in social and economic conditions related to the development and operation of Cades Bay Marine Reserve</p>
<p>Communication:</p> <p>Creating a shared vision of development within CBMR</p>	<p>To assess the different forums/ media used to promote social and economic development of Stakeholder through their participation in</p> <ul style="list-style-type: none"> • The creation of a forum for stakeholders to voice concerns • The formation of different interest groups • The recognition of traditional rights and privileges

METHODOLOGY:

Following the initial SocMon training workshop, Cades Bay marine Reserve was selected as the pilot site for study. There were some preparatory activities, including identifying goals of the socioeconomic monitoring, selecting the relevant variables, defining the process to conduct the socioeconomic monitoring, identifying and consulting with some stakeholders, and identifying the monitoring team.

Very early, there was some preliminary data collection through secondary sources and through observation. A general questionnaire (Annex 3) was devised to collect information from key informants, interest groups and the public. The questionnaire was administered mainly to households and business establishments within CBMR. It should be noted that while some questions were reserved for specific stakeholders others were specific to a general audience. In addition, information on some general issues such as public awareness and the quality and uses of beaches were gathered outside of the general questionnaire. The additional information was factored into the general report.

The data was later analysed so as to provide recommendations for communication and adaptive

management. A validation workshop with stakeholders, which was part of the original work plan did not occur due to time and other constraints.

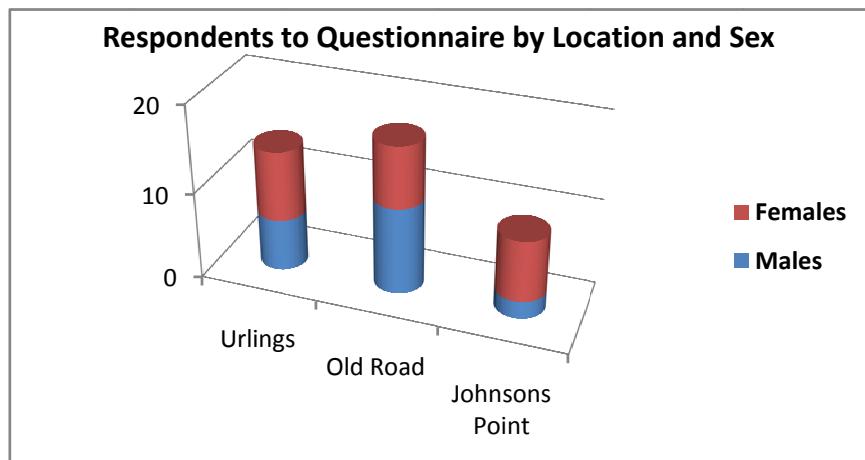
This technical report was written based on the information collected. The writer takes no responsibility for data inaccuracies provided directly by respondents to the questionnaire.

RESULTS OF THE QUESTIONNAIRE:

The results of the questionnaire are presented below, both descriptively and graphically. Responses are stated in the order of occurrence as presented in the questionnaire.

Question 1: Characteristics of Respondents

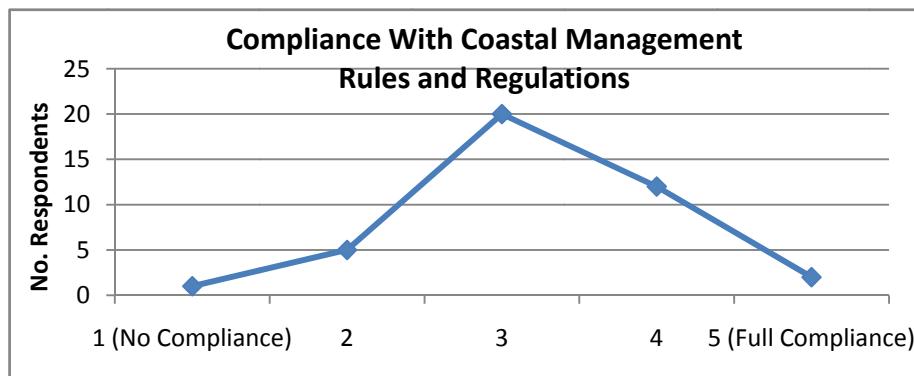
Respondents to the questionnaire included a wide variety of householders, including



homemakers, retired and unemployed persons to persons working in the fisheries, tourism, agriculture and transportation sectors. The graph above gives an indication of the respondents' responses to the questionnaire by location and sex.

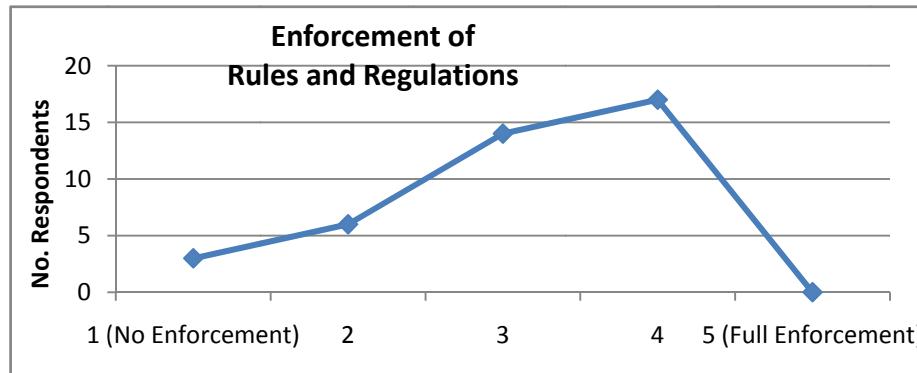
Question 2: Compliance

Most respondents perceive that people generally comply with coastal management rules and regulations within the CBMR area. The graph below gives an indication of the results.



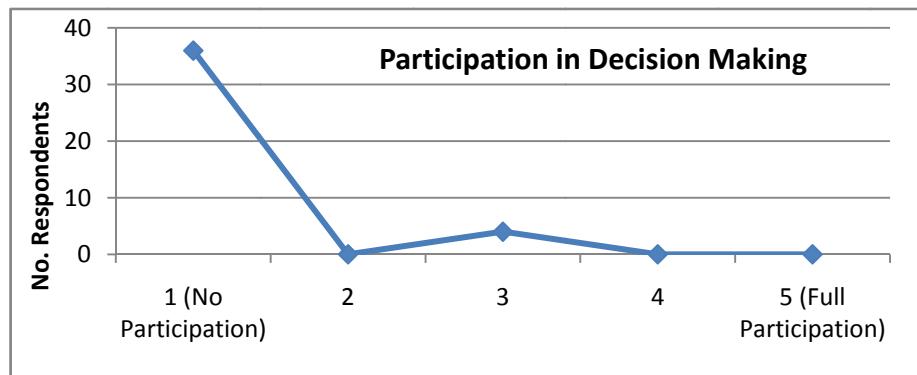
Question 3: Enforcement

It is the general perception that the rules and regulations governing MPAs are enforced by the relevant authorities. Some respondents indicated that there was no evidence of enforcement within CBMR.



Question 4: Community Participation

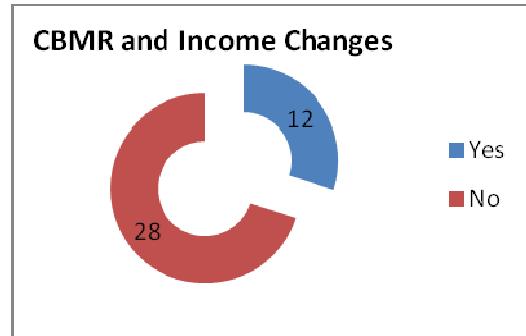
Most respondents indicated that they did not participate in or are involved in making decisions on how the coast including CBMR is managed. This is clearly illustrated in the graph below.



Question 5: Benefits from CBMR

The graph below indicates that most respondents did not experience changes to their means of income since the establishment of CBMR. However, there are mixed perceptions as to how changes might have occurred.

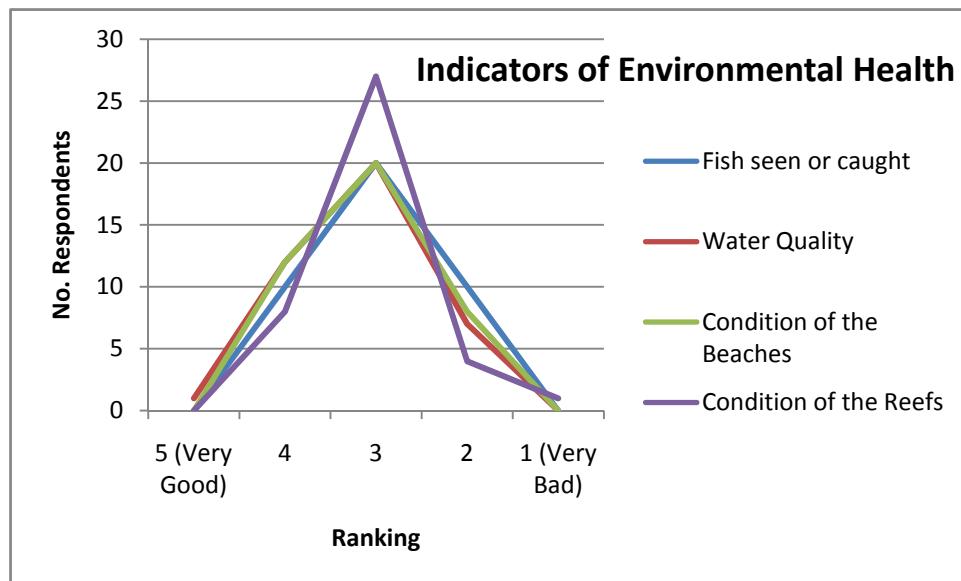
Reasons given for positive changes in income include: increases in the number of boats using the area, increased number of visitors to Cades Reefs, more investments and tourism business and more and better organized operations and activities within CBMR. Some fishermen have indicated that perceived changes have occurred because of the following: regulating spear fishing could increase the recruitment of fish and factors such as higher fish prices, shift in fishing methods, change of fishing gear and the operations of a Fisheries Complex in the area could be translated into more profits. Additionally, some respondents have indicated that there may be negative changes due to



increased fishing activity leading to more competition and increased activities in CBMR could result in additional stresses on some resources such as the coral reefs.

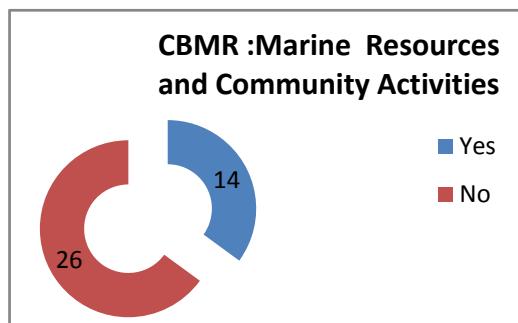
Question 6: Condition of Selected Resources

Most respondents rated current coastal resource conditions at just about average. This is illustrated in the graph below.



Question 7: Resource Use

The following graph shows that most respondents believe that the establishment of CBMR has



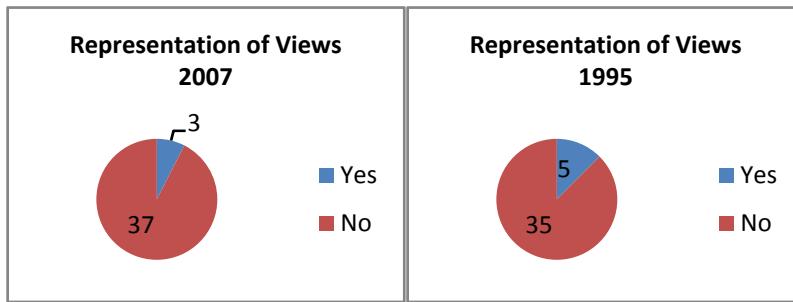
neither enhanced the uses of marine resource nor increased the number of activities within the community. It was indicated that development within the area has caused increased siltation affecting sea grass beds and coral reefs and many fish breeding grounds have been destroyed. There are also reports that less cockle digging now occurs and salt is no longer available from the Johnson's Point salt pond.

Respondents with the opposite view believed that the establishment of CBMR may cause the following:

- Assist the coastal and marine area through planting of trees, less mangroves being cut, reduce sand mining and the development of the Urlings Fisheries Complex providing more and better facilities for the fisheries sector and the security of boats.
- Change in lifestyles due mainly to expansion within tourism producing more business opportunities and even increasing living standards within the communities.

Question 8: Representation of Views

The views of most of the respondents were neither represented in how CBMR would be managed when it was initially established nor at the time when the questionnaire was administered. This is represented in the following graphs:

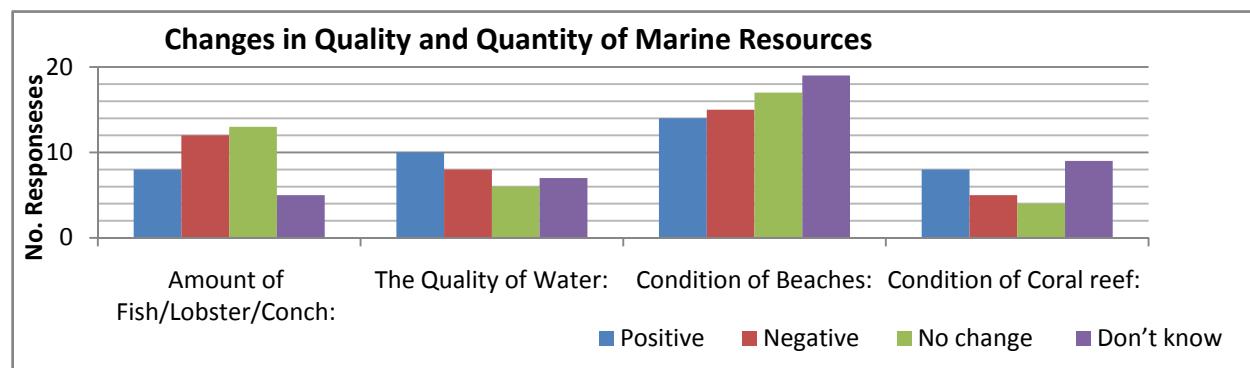


Question 9: Responses from Fishers

Fishermen have indicated that significant changes have taken place in the fisheries sector but these may not necessarily be as a result of the formation of the Cades Bay Marine Reserve. Bigger boats, with more powerful engines, that generally fish further distances and in deeper waters is one such change. Less spear-fishing is also reported. (Even though spear fishing is illegal, it is strictly prohibited in marine reserves).

Question 10: Resource Changes

The graph below shows perceived changes in the quality and quantity of marine resources over the past 5 years. Additional data outside of the questionnaire are also reflected in the graph.



Question 11: Problems associated with the establishment of CBMR

Below is a listing of some of the problems identified as associated with the establishment of the CBMR. No distinction is made to show problems that had more than one respondent and there is no ranking according to priority. Some responses given are positive contributions of the establishment of CBMR rather than problems.

- Problems if they (boat users) don't know the channel
- Drainage system problems
- Development of the Fisheries Complex is a good idea
- CBMR is a nice system
- Too much restrictions could cause problems
- No mangroves are used for burning coals at present (not really a problem)
- Stopping spear fishing is a good thing
- Carlisle Bay development is a problem since its construction aided the destruction of the environment.
- CBMR is promoting the idea : keep out locals and promote tourists.

Question 12 : Expectations for CBMR

Below are listed some of the things people would like to see occurring in CBMR. The listing is not in any order of priority.

- Nothing
- Building more hotels / fixing or reopening of Calalloo Hotel
- Not to build any more hotels
- Develop more Fisheries Complexes
- Cleaning of beaches (removing old vehicles, cutting bush, etc)
- Facilities (shower, toilets, changing rooms, park benches, garbage bins) on the beaches
- Beaches fenced
- Signage / displays on the beach and other areas
- Dredging along bays for better bathing
- Develop more tourist attractions and attract more tourists
- Vendor booths on the beaches
- Channels marked including lights
- Lights between the rocks
- Reefs markers including buoys
- Mangroves maintained / preserved / better marine life
- CBMR remains as a national reserve
- No cutting or destruction of the mangroves
- Protection of areas along the coast
- Stop beach sand mining
- Improved drainage
- Preserve fish breeding grounds
- Plant trees
- No marina for Carlisle Bay
- Stop spear fishing
- Stop harvesting of young conch
- Regulate fishing gear (no nets nor traps only line fishing allowed)
- Entire CBMR closed to fishing

ANALYSIS OF RESULTS:

This analysis is based mainly on the results of the questionnaire. It may be considered limited since there was no real validation of the responses. Responses are grouped relative to the nature of the question and similarity of thematic contents.

The sample is considered a good representation of the population of the communities within CBMR. Table 2⁶ shows some selected census data for the major communities of CBMR. The female/male ratio is approximately one (1.04 – 1.24) and the percentage of households sampled in each community within the study area ranges from 5 – 13 %.

Table 2 : Household Data for Major Communities of CBMR

Village / Settlement	Total No. Households	No. Households & Establishments Sampled	Male	Female	Total
Old Road	333	17	462	530	992
Urlings	298	14	374	404	778
Johnsons Point	70	9	74	77	151
Crabb Hill	49	0	63	78	141
Total	750	40	973	1089	2062

⁶ Based mainly on Census data (2001) for Antigua and Barbuda.

Characteristic of Respondents:

The questionnaire was administered to a wide variety of stakeholders, including homemakers, retired and unemployed persons to persons working in the fisheries, tourism, agriculture and transportation sectors. Except for Johnsons Point where there is a clear majority of female respondents there is generally a representative balance between the sexes.

Compliance and Enforcement of Regulations and Laws:

Several government agencies are responsible for coastal management rules and regulations throughout Antigua and Barbuda and by extension within the CBMR area. The Development Control Authority (DCA) and the Fisheries Division (FD), within the Ministry of Agriculture, Lands, Marine Resources and Agro-industries, are the main agencies that deal with marine reserves. Generally stakeholders will comply with rules and regulations that directly apply to them. However, there will always be the noncompliant minority with some specific excuse.

Compliance levels whether real or perceived is generally based on individual experiences. Many stakeholders may not be aware of the amount and types of enforcement that could occur within CBMR. They may not even know agencies are responsible for enforcement within the area. Their ability to rank enforcement may be biased for any given situation.

Decision Making and Management:

Based on the existing legal and institutional structure for the development of marine reserves it was difficult for some stakeholders to participate directly or be involved in making decisions on how the coast including CBMR is managed. Those whose livelihoods are directly based on harnessing resources would be mainly involved. These include the fishers, dive tour operators and hoteliers. Outside of this group, there is not much scope for other resource users. Once stakeholders were not directly involved in decision making their views could not be represented in how CBMR would be managed when it was initially established or as it developed.

Benefits of CBMR:

The development of CBMR has produced physical, social and economic changes in the area. Changes to stakeholder's means of income since the establishment of CBMR was used as an indicator of the benefits of CBMR. Direct users are able to more accurately reflect real or perceived changes that might have occurred. The changes may be positive or negative based on reflected impacts on users of the CBMR.

On the one hand, increased development within CBMR, improved enforcement and monitoring have been linked to increased use thus producing positive changes in incomes. Conversely, increased use provides more competition within CBMR thus resulting in additional stresses on some resources such as the coral reefs. It is however evident that most stakeholders may not fully recognize the real or potential benefits of the CBMR.

Some stakeholders have reported significant changes, whether real or apparent, noticed in their sector. For example, Fishers indicated changes in the fisheries sector but these may not necessarily be as a result of the formation of the Cades Bay Marine Reserve. The sector benefited from general scientific research and technological development throughout the country. In addition, an upgrade in the Fisheries legislation may also be a factor. The benefits of regulating fishing within a marine reserve were widely recognized. For example, harvesting undersized conchs, banning of spear-fishing, regulating the type of fishing gear and the introduction of closed season were notable suggestions.

Status and Uses of Natural Resources in CBMR:

The general conditions of most coastal resources are rated just about average by a majority of the respondents. The four indicators of environmental health show similar conditions. Although specific users could report on the actual status of the resources a high percentage of the comments are not scientific. Scientific studies, including the representative indicators of environmental health, could be quite revealing.

Fishers have indicated that the amount of fish lobster and conch have either not changed or reduced in quality and quantity. About 30% of the people did not know if there were changes or indicated a positive change. Generally, the quality of water in coastal areas of CBMR was considered to be quite good. The quality of the beach may be questionable considering the number of persons who indicated that there is either no change or did not know if there was a change. Only about 40% of the people gave a positive rating to the quantity and quality of the coral reefs within CBMR. These results, however, need to be substantiated by scientific evidence.

While most people believe that the establishment of CBMR has neither enhanced the uses of marine resource nor increased the number of activities within the community there is a general recognition of the linkages between socio-cultural activities and the natural environment. References are made to increased siltation affecting sea grass beds and coral reefs resulting in the destruction of fish breeding grounds. There are also reports of the reduction of traditional activities such as salt harvesting, cockle digging, whelks picking and crab hunting. This may indicate a need for specific studies on traditional coastal resource usage within CBMR and other areas around Antigua and Barbuda.

The establishment of CBMR has also been associated with activities that produced positive environmental impacts. The coastal and marine area have benefited through increased planting of trees, less mangroves being cut, less sand mining and the development of the Urlings Fisheries Complex providing more and better facilities for the fisheries sector and the security of boats. There are also changes in lifestyles due mainly to expansion within tourism producing more business opportunities and general enhancement of the communities.

Problems associated with the establishment of CBMR:

While the benefits of CBMR were recognised there were specific problems that were identified as associated with its development. The main issues are related to resource use and the regulation of such uses.

The development of CBMR provided for the zoning of the area and specific restrictions on the use of spear guns for fishing.⁷ Some stakeholders had the view that introduced restrictions could be a source of additional problems. Competition for resource use was also identified as a potential problem. There is direct competition for the use of beaches by sea bathers in tourism and by fishers who need the space for landing fish. Tourism related development and uses was emphasized in preference to traditional and local cultural uses of the coastal environment.

There were other issues identified which were not directly related to the establishment of the CBMR. These include drainage problems within the area and problems related to the use of the channel leading into the Fisheries Complex at Urlings. Most of the issues will need further investigation.

⁷ Fisheries Regulations 2006 (Draft), Management Plan for Cades Bay Marine Reserve (2002)

Expectations for CBMR:

A wide range of activities associated with the establishment of CBMR are anticipated by the general population of the area. Expectations vary from doing nothing to the implementation of several conservation activities.

Conservation Activities:

Beach clean up

Maintenance and preservation of mangroves, other coastal vegetation and marine life

Planting of appropriate trees and plants along the coast

Protection along the coast

Stop sand mining

Preserve breeding grounds for fish

Stop spear fishing

Stop harvesting of undersize conch

Regulate fishing gear within CBMR

Closed zones (to fishing and other uses)

Preserve the CBMR as a national reserve

Provide Specific Facilities for Tourism, Fisheries, etc.:

Construct beach facilities (signage / displays, vendor booths, shower, toilets, changing rooms, park benches, garbage bins, fencing)

Provision of more hotels / fixing or reopening of abandoned Hotel (Some suggested no more hotels should be constructed)

Develop more Fisheries Complexes in the area (No more marinas also suggested)

Improved channel (dredging and marking including lights)

Reef marking including use of lights and buoys

RECOMMENDATIONS AND FOLLOW UP:

The Cades Bay Marine Reserve has been in existence for nearly a decade. There are spatial, temporal and sectoral variations of its impact on the physical, social and economic landscape. The severity of impact is a function of the existing legal arrangements and established institutional structures for protected areas (PAs) management and development in Antigua and Barbuda. There is also clear evidence that the education and public awareness programmes for PAs is generally weak or nonexistent. In the context of this background, this study points to the general need for the following:

- Detailed scientific studies related to the protected area environment and more specifically CBMR should be developed. These should focus on issues such as resource status and use (both spatially and temporally), impacts of PAs and community participation in the management and development of protected areas.
- Upgrading of legislation related to PAs and the restructuring of related institutional arrangements should be a priority. A specific Protected Areas Management and Development Policy and Plan (PAMDPP) could then be instituted. There should be a broader Systems Plan for PAs within which individual areas such as CBMR can be managed and maintained.
- There should be an on-going environmental education and public awareness programme within which issues of PAs could be addressed. Communities would be more aware of

established programmes for PAs such as CBMR.

Specific to CBMR, the following could be major focal activities:

- An extensive outreach programme to sensitise and inform the relevant communities of the importance of CBMR.
- The formation of a community-based organisation (CBO) to assist in the management and development of CBMR.
- Completion/finalisation of the Management Plan for CBMR. This should aid in finalising issues such as zoning and resource use.
- Government agencies, such as the Fisheries Division, should continue working with major stakeholders including the communities in maintaining and preserving the natural landscape within CBMR.

Experiences in this study have shown that depending on the nature and extent of the protected area, much time and effort are necessary to conduct a comprehensive SocMon evaluation. There is also a general need for further studies in the future.

REFERENCES:

Antigua and Barbuda Fisheries Act 1983

Antigua and Barbuda Fisheries Regulations 2004 (Draft)

Bunce, L. and R. Pomeroy. 2003. *Socioeconomic monitoring guidelines for coastal managers in the Caribbean (SocMon Caribbean)*. World Commission on Protected Areas, Gland.

Government Statistical Division, 2006. Complete Summary Census Report (2001)

James, P. A., 2002. Management Plan for Cades Bay Marine Reserve. OECS Small project Facility 2000.047 / DFID. SP

ANNEXES:

ANNEX I: Activities and Outputs

Socioeconomic Monitoring in Cades Bay Marine Reserve

Activities: (As stated in the MOU)

- Preparatory activities, including identifying goals of the socioeconomic monitoring, selecting the relevant variables, defining the process to conduct the socioeconomic monitoring, identifying and consulting with stakeholders, and identifying the monitoring team
- Data collection through secondary sources
- Data collection through key informants
- Data collection through surveys
- Data collection through observation
- Data analysis, communication and adaptive management
- Validation workshop with stakeholders (Time and other constraints did not permit this activity to occur)

- Report writing

Outputs:

- Documentation of socio-economic data on the stakeholders of the Cades Bay Marine Reserve including the level of public awareness; various uses of the marine park; level of activity within MPA boundaries.
- One terminal report to UNEP-CAR/RCU to include a copy of the socio-economic monitoring report. (Based on time and other constraints, only the socio-economic monitoring report was submitted).

Annex 2 Budget

Approximate Budget in Eastern Caribbean Dollars (EC\$)

Item of expense	No. of units	Unit cost*	Total cost*
Stationary and Office Supplies and equipment use			600.00
Ground Transport	5	100.00	500.00
Maps and other related resources			125.00
Interviewing Activities			3000.00
Sum Total SocMon Costs			EC\$ 4225.00
			US\$ 1571.00

*currency used = EC\$ (1 US\$ = EC\$2.69)

Annex 3 Questionnaire

SocMon Questionnaire

Cades Bay Marine Reserve (CBMR)

April 2007

Questionnaire Number: _____ Location : (Village) _____

1) What work do you do? _____ Sex: Male Female

Compliance and Enforcement

- 2) On a scale of 1 to 5 (1=No Compliance, 5=Full Compliance) to what extent do people comply with coastal management rules and regulations? _____ (**Fisheries Regulations, DCA rules, etc.**)
- 3) On a scale of 1 to 5 (1=No Enforcement, 5=Full Enforcement) to what extent are the rules and regulations enforced? _____ (**DCA, Fisheries, Government enforcing laws**)
- 4) On a scale of 1 to 5 (1=No Participation, 5=Full Participation) to what extent do you participate in or is involved in making decisions on how the coast including CBMR is managed?

Livelihood

5) Has your means of income changed since the establishment of CBMR? (1999) Yes No
How?

Marine Resource Uses and Activities

6) How would you describe current coastal resource conditions on a scale from Very Good (5), Good (4), Not Good Not Bad (3), Bad (2), to Very Bad (1)

Amount of Fish seen or caught _____ The Quality of Water _____ Condition of Beaches _____ Condition of Coral reefs _____

7) Has the CBMR enhanced the uses of marine resource and increased the number of activities within the community? Yes No

How? _____

Governance

8) Were your views represented in how CBMR would be managed when it was established?
 Yes No

Are your views better represented now? Yes No

Fish Technology and Practices (only fishers)

9) What changes have been made in fishing technology and practices since the establishment of the CBMR? (Changes in boats, fishing gear, how you fish, etc.,)

10) What changes in the quality and quantity of marine resources have you noticed over the past 5 years?

Amount of Fish/Lobster/Conch: Positive Negative No change Don't know

The Quality of Water: Positive Negative No change Don't know

Condition of Beaches: Positive Negative No change Don't know

Condition of Coral reef: Positive Negative No change Don't know

General (All)

11) What problem do you think will occur with the establishment of CBMR?

12) What are some of the things you would like to see happening in the CBMR area?
