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**"Antigua and Barbuda: A Legacy of  
Environmental Degradation, Policy  
Failure, and Coastal Decline"**

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Working Paper Case Study - Antigua and Barbuda: A Legacy of  
Environmental Degradation, Policy Failure, and Coastal Decline\*

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# Foreword

This "Supplementary Paper" is a product of the Environmental and Natural Resources Policy and Training (EPAT) project funded by the United States Agency for International Development (USAID). EPAT is part of USAID's effort to provide environmental policy information to policymakers and practitioners in developing countries. The objective is to encourage the adoption of economic policies that promote sustainable use of natural resources and enhance environmental quality.

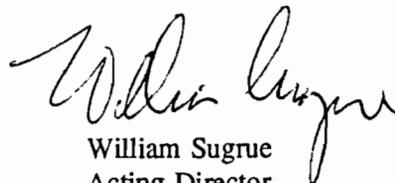
EPAT "Supplementary Papers" are intended to augment the EPAT publication series. They typically focus on technical aspects or contain extensive details on a topic of interest to a particular segment of the EPAT audience. They may also assist development professionals, civil servants, project officers, and researchers who are directly involved in the implementation of development activities.

This "Supplementary Paper" describes the impacts of tourism and residential growth on coastal resources in Antigua and Barbuda. It includes background information on the economic, demographic, and environmental context as well as the roles and responsibilities of state agencies and non-governmental organizations concerned with coastal conservation. It concludes with a summary of major threats to coastal resources and presents a comprehensive policy response. This policy framework emphasizes integrated planning, widespread NGO and community participation, environmental education, and government commitment. The study provides policymakers with useful insight in dealing with coastal resource preservation and development in small island states.

USAID has supported part of the preparation costs of this paper and the nominal costs of duplication and mailing in response to requests from interested EPAT readers. The total amount is estimated to be \$2,000. The availability of the paper is being announced to more than 2,000 policymakers and professionals in developing countries. We will assess its effectiveness by soliciting the views of recipients. An evaluation sheet is enclosed with each mailing of EPAT/MUCIA publications for that purpose.



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## INTRODUCTION

### Scope

After an introduction to the island setting, this case study comprises six sections. The first provides the economic and demographic context. The former emphasizes the role of tourism; the latter highlights 1991 census results with an emphasis on urbanization/suburbanization and population density trends.

The second provides a comprehensive qualitative assessment of impacts on coastal resources as a result of tourism and residential growth. It includes assessments of these impacts on bays and beaches, salt ponds and marshes, fringing reefs and off-shore islands, and the four main harbors.

The third examines the role and responsibilities of various state agencies and institutions involved with coastal resource conservation. It also discusses the major nongovernmental organizations (NGOs) concerned with coastal conservation.

The fourth examines the local and regional institutional context. The former includes a discussion of coastal and related legislation and enforcement, the balance of local political power, and the influence of the media. The latter develops the tourism destination life cycle including the position of Antigua-Barbuda in the context of 20 small Caribbean islands. Regional environmental organizations are also discussed.

The fifth assesses the impact of grassroots NGOs and stakeholder self-management groups on coastal preservation by reviewing four resort development case studies and sand mining: Jolly Harbour, Marina Bay, and Coconut Hall in Antigua and the "K" Club and sand mining in Barbuda.

The sixth recaps the major threats to coastal resources and presents a comprehensive policy response that emphasizes integrated planning, widespread NGO and community participation, environmental education, and--in contrast to past neglect--a serious commitment to coastal conservation at the highest levels of government.

### Island Setting

The sister islands of Antigua and Barbuda (A/B), together with uninhabited Redona, lie some 250 miles east-southeast of Puerto Rico and roughly midway between the Northern Leewards and Southern Windwards that comprise the Lesser Antillean chain in the Eastern Caribbean. A/B is relatively small in population (59,355, 1991 Census) and in land area (170 sq. mi.). Antigua considerably dominates Barbuda in population (58,114 to 1,241) and is nearly twice as large (108 to 62 sq. mi.).

Physically, the two islands are also distinct. Antigua is coralline and volcanic in origin where flat central plains give rise to gently rolling hills in the north and east, and higher volcanic hills and fertile valleys in the southwest. The coastline is deeply indented with abundant wetlands, beaches, and fringing reefs (CEP, 1991: 1-27). Barbuda, 28 miles to the north, is a very low limestone island without indentations but with an abundance of sand dunes. It is dominated by Codrington Lagoon which extends over one mile wide nearly the entire length of the ten-mile western coast.

Several historical and natural features unique to A/B provide the context for careful coastal resource planning and management. Because of their gentle topography and central location, the islands boast an extensive prehistory of Indian settlements extending to 3,500 BC. Over 100 prehistorical sites have been identified in Antigua, and they are concentrated in coastal areas (D. Nicholson, n.d.). Colonized by Great Britain in 1632, the islands were quickly transformed into tobacco, cotton and sugar plantations which rapidly decimated virgin forests. Abundant remnants of sugar mills and fortifications also dot the coastal regions as testimony to Antigua's rich sugar history and strategic role as headquarters for the British Navy in the Leewards.

The post-emancipation era was characterized by absentee expatriate plantation ownership, heavy peasant emigration, and a weak tradition of land husbandry and environmental awareness. The collapse of export sugar and cotton in recent decades has coincided with attempts at small-scale food production and livestock raising for the local market, aggressive tourism development and light manufacturing. This restructuring has created a terrestrial legacy of overgrazing and devegetation particularly dangerous in the relatively dry (40-45 inches of annual rainfall) Leewards where habitats are easily disturbed and slow to recover. One consequence has been the gradual concentration of endemic and other species in the heavily-indented, wetlands-rich coastline areas where tourism growth has been most intense and intrusive.

## ONE: ECONOMIC AND DEMOGRAPHIC CONTEXT

### 1960s Tourism Boom

The past two decades have witnessed the continuing restructuring of the economy away from colonial cotton and sugar towards tourism, related construction and light manufacturing. Between 1977-1993, agriculture's share of GDP fell from 10 to 3.7 percent (see Table 1). Although marginal increases in domestic food and livestock were recorded, fishing effort declined nearly 45 percent over the period.

On the other hand, substantial gains were made in tourism and related sectors: construction, sand mining, transport and

communications. The GDP contribution of these five sectors advanced from approximately a third to over half of GDP indicating indirectly that tourism may account for half of all activity as others have suggested (Weston, 1990; Thorndike, 1986). Although light manufacturing (textiles, electronics, assembly etc.) has doubled absolutely over the period, its GDP share has remained small (5%) because of high local costs, labor scarcity, and weak regional export markets.

Most growth and diversification took place during the 1980s. The total number of visitors (stayover and cruise) and hotel rooms doubled, and electricity production tripled. The number of telephones and vehicles tripled, and construction permit value rose seven times. Average annual GDP grew roughly 7 percent, as did yearly inflation. Per capita real GDP rose over 2.5 times to roughly US\$6,350 in 1991.

### Economic Imbalances

Because of the strength and concentration of this tourist-related growth, the same decade witnessed the emergence of several interrelated structural imbalances that have inhibited recent growth and reduced A/B's capacity to respond to long-term economic and environmental problems. These include excessive reliance on tourism and external financing, mushrooming trade deficits, budget deficits, a deteriorating infrastructure, and sectoral wage/employment imbalances. For example, real GDP stagnated between 1981-82 largely as a result of the sharp drop-off in visitors at the same time, with full tourism recovery arriving only after 1984. Similar growth deceleration since 1990 is linked to the slowdown in visitor expansion compounded by economic mismanagement.

The 1980s tourism boom was heavily supported by foreign debt. External indebtedness rose nearly five-fold (see Table 2) during the five-year 1985-1990 period to finance the construction of the Royal Antigua Hotel and Heritage Quay duty-free shopping complex, airport expansion, and road and other infrastructure repair. Presently, the size of this debt burden has become a serious drag on growth. At the end of 1992, it represented over 40 percent of total outstanding debt for all 9 OECS countries (ECCB, 1993:16). At the end of 1993, the total debt plus interest and arrears amounted to US\$377 million, nearly equal to market GDP at factor cost. Debt service amounted to 10 percent of GDP and 70 percent of Central Government revenue (Caribbean Week, 1994).

Such heavy external borrowing was necessitated partly by recurring budget deficits resulting from excessive internal borrowing and high inflation-induced wage pressures from government employees (McElroy and de Albuquerque, 1990). The debt's legacy today is the continuing postponement of needed public investment, labor market distortions that favor government, tourism and

construction over agriculture and manufacturing, and generally slower overall growth. By default, long-standing environmental restoration, mitigation, monitoring and enforcement plans are neglected or poorly implemented.

### Current Situation

Since 1990 growth has declined to less than half the 1980's rate. Between 1991-1993 public investment contracted because of external debt obligations, and private investment was dampened because of uncertainty from the rolling recession in major tourist origin markets. In some years construction and mining recorded negative growth (ECCB, 1990:21). Agriculture has continued to be plagued by distribution bottlenecks, and light manufacturing has steadily declined amidst major plant closings, downsizing, and weak market demand. However, a 1994 economic upturn seems likely with favorable growth in tourist arrivals and a pick-up of public construction on roadways, public buildings, and airport repairs (ECCB, 1994:10). But there are ominous clouds on the horizon. Much of the increase in visitor bookings is all-inclusive business with negligible local impact beyond the resorts themselves. The winter 1994-95 season has started more poorly than expected and occupancy rates for many hotels are much below normal. The economy is also reacting to the Government's proposed Structural Adjustment Programme (SAP) designed to reign in spending, cut public employment, and raise revenues (especially customs and property taxes). However, reduced payrolls have not yet appeared, foreign cargo continues to escape inspection, and uncollected property taxes mount.

### Population Size

The 1991 Census, the first complete census to be conducted in Antigua-Barbuda since 1960, enumerated a total population of 59,355, with 58,114 persons in Antigua and 1,241 in Barbuda (see Table 1). This count, based on all persons residing in the two islands on census night (May 28, 1991) regardless of citizenship, was 22,000 to 25,000 persons less than estimates made by the Department of Statistics and various Government Ministries. The unexpected low 1991 Census count prompted a lot of debate in Antigua regarding the conduct of the census and the usual enumeration problems. However, we are fairly confident, having followed the census operations closely, that the 1991 Census achieved about 95% coverage. An estimate by the Census Office, for households which were known to exist but could not be contacted (refusals etc.), indicates that about 3,000 persons were not enumerated.

Table 3 shows the population of Antigua-Barbuda by parish and island as enumerated in the 1960, 1970 and 1991 censuses. The 1970 Census was based on a sample of returns and is therefore not a complete census. Between 1960 and 1991 the population of Antigua-

Barbuda grew by only 9.3 percent, reflecting an average annual rate of growth of 0.29 percent. This very low growth rate can be explained by extensive emigration, the magnitude of which was revealed by the 1991 census count.

### Population Distribution

Table 3 also shows changes in the population distribution between 1970 and 1991. Like most small Caribbean islands, settlement patterns in Antigua have long favored residence in and around the capital/port city and reflect a strong urban orientation (McElroy and de Albuquerque, 1981). In 1960, 53.3 percent of the population of Antigua-Barbuda resided in the city and parish of St. John's, about the same percentage recorded in the 1946 census. By 1991 the city and parish of St. John's accounted for 60.0 percent of the population. Areas of greatest growth between 1970-1991 were all those within easy commuting distance of the city of St. John's and along the major road arteries leading into the capital--Factory Road (St. John's Village, Potters, Sutherlands), Old Parham Road (Skerrets, Sutherlands, Casada Gardens), Fort Road (Gambles, Gambles Terrace, Paradise View), Friar's Hill Road (Upper Gambles, Friar's Hill), All Saints Road (Ottos, New Town, Branns, Belmont), and Valley Road (Gray's Hill, Nut Grove, Golden Grove, Creekside).

Along with the parish of St. John's, only two other parishes experienced population growth since 1960, St. George's which grew by 22.7 percent and St. Peter's which grew by 13.5 percent. Growth in St. George's was primarily due to growth in those areas within close commuting distance of St. John's city--Winthorpes, Barnes Hill, Piggott, and Coolidge.

Linked to increasing urbanization/suburbanization of Antigua has been the steady loss of population from some of the more distant less tourist penetrated rural communities. The parishes of St. Phillip's, St. Paul's, and St. Mary's experienced declines between 1960-1991 of 28.2, 5.1, and 22.0 percent respectively. These declines were not experienced evenly throughout these parishes. For example, in the Parish of St. Paul, tourism related growth in the English Harbour-Falmouth area, led to significant population increases in the English Harbour/Marsh Village and Falmouth/Cobbs Cross areas. However, the village of Liberta lost population. The 1970 Census estimated Liberta's population at 2,394, but in 1991, only 1,473 persons were enumerated in Liberta. Similarly, communities like John Hughes, Buckleys, Sawcolts, Swetes, and Bethesda have been losing population as people leave to be closer to their jobs in St. John's. Like the experiences of other islands (e.g. the United States Virgin Islands, New Providence, St. Maarten) which have undergone the tourism-led economic restructuring currently underway in Antigua, it is anticipated--despite some of the disaggregating effects of tourism--that there will be a further concentration of economic activity in and around the city of St. John's. Furthermore, with planned

improvements in the infrastructure, the continued growth in household and personal income, and the ubiquity of the automobile, the pace of suburbanization (into St. John's parish) should quicken.

In Barbuda, almost all the population is clustered in and around the town of Codrington. Codrington proper has about 66 percent of the population. The adjoining area to the north of Codrington along River road has 24 percent of the population, and the area to the south of Codrington has the remaining 10 percent.

### **Population Density**

Antigua-Barbuda's population density of 349 persons per square mile (Table 4) is average by Organization of Eastern Caribbean States (OECS) standards. However, if Antigua were taken alone, its population density would rank it near the top with Grenada and St. Vincent. With projected increases in population, densities will rise and will require greater planning efforts to avoid the accompanying environmental and social problems so evident in small, densely populated mass tourism islands (St. Thomas, St. Maarten, etc.). Already in some areas of the city of St. John's, densities of close to 10,000 people per square mile are common, and since these areas often have inadequate sewage and sanitary facilities, concerns about public health issues have increased. While population density in the parish of St. John has increased, there are indications that population pressure in the city of St. John's has eased (the census data for 1960 and 1991 are not comparable because the city's boundaries were expanded in 1976).

Barbuda's population density is extremely low by Caribbean standards, largely because its drier sandy environment has been historically incapable of supporting a large population.

Table 4 shows a significant increase in the number of households between 1960 and 1991, particularly in the island of Barbuda where the number of households increased by 53 percent. The parish of St. John's also saw a 53 percent increase in the number of households, and in adjacent St. George's the number of households increased by 59 percent. Only St. Phillip's saw a decrease in the number of households (abandonment etc). This significant increase in the number of households is a good proxy measure of the strong performance of the Antiguan economy in the 1980's when the construction sector was extremely vibrant. Increases in the number of households have been paralleled by decreases in household size. In 1960, the average household in the city of St. John's had 3.9 persons and by 1991 this had declined to 3.1 persons. Average household size for Antigua as a whole dropped from 4.2 persons in 1960 to 3.2 persons in 1991. In Barbuda, household size declined from 4.8 persons to 3.4 persons.

### **Fertility**

Fertility estimates for Antigua and Barbuda have to be revised in light of 1991 census results. Table 5 shows a significant decline in the birth rate, from 34.6 in 1960 to 21.2 in 1991. Comparatively speaking, this puts Antigua-Barbuda slightly lower than most other OECS states, with the exception of Montserrat. The total fertility rate (TFR) computed from 1991 census data was 2.5, a substantial decrease from 1970 when it was 3.3. However, the 1991 TFR was much above the projected TFR of 1.7. Fertility decline in Antigua can be explained by invoking "modernization" factors--improvements in female educational attainment, greater female labor force participation, the widespread availability of contraceptives and delayed marriage. Additionally, values regarding family size have also undergone a change, and Antiguan women today appear to desire fewer children than did their counterparts 20 years ago.

### Mortality

Declines in mortality (Table 5) have been less marked because the mortality transition has been underway significantly longer than the fertility transition. There is some evidence to indicate that the crude death rate reached its nadir at about 6 per 1,000 population and is inching upwards with the aging of the population. Life expectancy for both sexes is currently estimated at 72 years. Mortality rates in A/B are lower than in the United States and Canada because of the relatively young population (PRB, 1993). Improvements in medical care, living conditions and nutrition have certainly contributed to increased life expectancy, but changing dietary habits, particularly the consumption of high fat and processed, frozen and canned food, have already ushered in a whole new series of diet-related health problems.

Private medical care and the Holberton Hospital are adequate for the basic health needs of the population, yet the practice of seeking both routine and specialized health care off-island (Guadeloupe, Puerto Rico, U.S. Virgin Islands, the United States and Canada) continues. The Springview Hospital on Barbuda is also adequate but still relies on expatriate doctors and dentists brought in on a rotational basis.

### Migration

Like most Caribbean societies, A/B has had a long migration tradition: to Panama and the Bermuda dockyards at the turn of the century, the Dominican Republic the first two decades of this century, Aruba and Curacao in the 1940's and 1950's, Great Britain in the late 1950's and early 1960's, and the United States, the United States Virgin Islands (USVI), and Canada after 1962. Emigration declined significantly after 1973, particularly following the tightening of immigration restrictions in the USVI, the most popular destination for Antiguan in the 1970's. Since the late 1980's, Antiguan have been returning from the USVI and

elsewhere to retire or set up businesses, yet return migration remains an unappreciated phenomenon of significant policy relevance (returnees often have considerable savings and much needed skills).

Table 6 shows that an estimated 26,218 persons emigrated between 1960 and 1991, a spectacular number given the fact that during this period the total resident population was slightly over twice this number. Most of this emigration would appear to have been to the USVI and the U.S. mainland (Table 6).

Immigration into A/B has received very little attention from the Government, yet the 1991 census revealed that 20.8 percent of the population is foreign born (Table 7). If the experiences of other Caribbean mass market tourist destinations (e.g. the Bahamas, the USVI, Cayman Islands, St. Maarten) are any guide, immigration might become a vexatious policy issue in the future. Significant immigration into Antigua began in the early 1960's when persons from the island of Dominica came over to work in the nascent tourist industry. Today, persons born in Dominica represent 21 percent of the total foreign born population (Table 7). They are closely followed by Guyanese, mostly of African origin, who began arriving in 1985, primarily to fill the teacher shortage. Besides teaching, Guyanese are to be found in the hotel industry, building trades and in manufacturing. The next largest groups are of persons born in the United States, the United Kingdom and the neighboring island of Montserrat. The first two groups are split between expatriates (professionals, business persons and retirees) and children of returnees born in the U.S. or the U.K. There is a sizable and growing retirement community of primarily North Americans--a phenomenon whose long-term social and economic consequences have not been seriously examined in the region (see McElroy and de Albuquerque, 1992).

Other groups of importance are Vincentians, recruited mainly to serve in the Police Force, and persons from the Dominican Republic, working mainly as "hostesses", service workers and in manufacturing. Two foreign born groups whose economic importance far outweighs their numbers, are the Syrians/Lebanese and the Chinese (Hong Kong). The latter group began arriving in significant numbers in 1989, many by purchasing Antigua passports, and their numbers have swelled during the past few years. The former are part of an early immigrant community that began arriving in the 1960's and early 1970's, and found an economic niche, initially, through "suitcase" trading. This community dominates the retail trade in Antigua, and counts among its members some of the wealthiest most influential citizens. Since 1987 this community has expanded rapidly through the recruitment of young male relatives directly from Syria and Lebanon.

Sex ratios of the various foreign born groups reflect their occupational clustering--male Vincentians as policemen, Jamaican

females as nurses and teachers, Dominicans and other Eastern Caribbean female immigrants as hotel and restaurant workers.

### Age and Sex Structure

The imprint of migration is clearly visible in the age and sex structure of the population (Table 8). In 1970, the working-age population (15-64) accounted for only 50.7 percent of the total population. By 1991, it had increased to 61.3 percent of the population, as a result of a combination of factors: falling birthrates, increasing life expectancy, and declining emigration opportunities. The latter were most keenly felt in the younger (15-34) working-age population. The sex ratios also point to the effects of emigration, with the early migrant stream in the 1960's being dominated by males (e.g. cane cutters to St. Croix) and subsequent migrant streams favoring female workers slightly. Significant increases in the proportion of persons over 65 years and in the sex ratio of this group point to increases in life expectancy and also to return migration, with male returnees coming home first.

Despite a slowdown in the Antiguan economy since 1990, labor shortages continue in many areas, particularly in hotels and restaurants, construction, teaching, and health care. The number of work permits issued to foreigners continues to rise.

## **TWO: EXTENT OF COASTAL RESOURCE IMPACTS**

### Introduction

When Antigua was settled by Europeans in the 17th century it was described as a heavily wooded island where fresh water and timber could be readily obtained. Today the island is almost entirely deforested from centuries of burning and cutting down trees to plant tobacco, cotton, indigo and later sugar. This devegetation continued downstream after the decline and phase-out of export monoculture. With livestock overgrazing on the hillsides and intrusive tourism development, infrastructure construction, and sand mining in the coastal regions.

Barbuda, also settled by Europeans in the 17th century, being drier and having poorer soils, was unable to support intense agriculture, and was used primarily for raising livestock for the Codrington estates in Antigua. The livestock were allowed to run wild and today Barbuda is plagued by the problem of feral livestock (donkeys, goats, sheep, horses etc.) who are responsible for some of the destruction of Barbuda's vegetation, including such hardy species as acacias. The Barbuda environment must have been wetter with less scrub vegetation at the time of settlement, since the early settlers called the island "Dulcina" for its "excellence and pleasantness thereof" (Nicholson, 1991).

## Beaches and Bays

Tables 9-14 provide a quick qualitative assessment of A/B's coastal resources. Like any quick qualitative reference guide, they suffer from problems of subjectivity and incompleteness. However, in the absence of good baseline and continuing scientific data on what is happening to A/B coastal resources, the tables provide a useful guide for the ensuing discussion.

The tourist promotional literature on A/B touts the islands as having 365 beaches--"one for every day of the year". While this is a bit of advertising hyperbole, A/B are well endowed with some of the finest beaches in the world. Indeed, Barbuda has one of the longest beaches in the Caribbean stretching about 22 miles, with the sand being Bermuda pink in places. Unfortunately, tourism development on many of the more accessible beaches in A/B has occurred in the absence of the normal kinds of set-back requirements, concerns for preserving shoreline vegetation, and overall environmental safeguards necessary to sustain their recreation appeal into the next century. In fact, resort/marina encroachment on beaches and shorelands in A/B has taken place in the absence of any controls, with developers having virtual carte blanche to design/expand their properties irrespective of their despoliation of A/B's most precious natural resources.

The two best known beaches in Antigua, Dickenson Bay and Runaway Bay, have been colonized by a variety of hotels, condominiums, apartments, cottages, restaurants and beach bars, and are fast taking on the appearance of beaches in some of the mass tourist Caribbean destinations such as Aruba, Barbados or St. Maarten. Kitchen waste is routinely piped/dumped into these two bays, and occasionally sewage, because of frequently malfunctioning sewage treatment plants. An environmental impact assessment (EIA) found surprisingly high coliform counts in water samples drawn from both bays (Jackson, 1987). Pollution and damage to corals and sea grass beds from water related activities (jet skis, pleasure boats etc.) is extensive. In addition, a marina/condominium project located at Corbison Point between the two bays, cut a channel from the northern end of Runaway Bay into MacKinnons salt pond, causing considerable siltation from dredging operations (de Albuquerque, 1991). Both beaches have experienced steady erosion over the years because of tourism related development activities and sand mining (in the Dry Hill area of Runaway Bay).

Fort Bay (Fort James), one of the first beaches to be designated a public beach, and a popular bathing beach for both locals and tourists, has experienced heavy erosion over the years. The surrounding area has been the site of dumping of dredge materials. Currently many casuarina trees are being bulldozed down, and some sand mining has occurred. Purportedly a public beach, Fort James has a number of beach bars/restaurants, and the output of solid waste (cans, plastics, etc.) from these operations

is significant, particularly on weekends and holidays. Other so-called public beaches (Ffryes, Darkwood, Morris Bay, Pigeon Pt., Halfmoon, and Jabberwock) are experiencing similar development pressure. At Darkwood, the area adjacent to the beach is being bulldozed. At Pigeon Pt. beach bars have appeared and residential development is cutting into the surrounding hillsides. At Jabberwock, there is considerable litter and solid waste dumping. Only Halfmoon Bay approaches the ideal of a public beach because of its park status.

The beaches from Yeptons to Hawksbill Bay are also under development pressure and show evidence of degradation (beach and shoreline erosion, extensive brush and tree clearance etc.). The only three beaches that are near pristine in the Five Islands area are Landing Bay, Pinching Bay and New Division Bay, and this primarily because of accessibility problems.

Of great concern to many Antiguans is the severe beach erosion in Hermitage Bay and Pearns Bay and the destruction of shoreline vegetation due to illegal sand mining operations. In fact, the area from Pearns Point to Ffryes Bay is under considerable environmental stress mostly from the Jolly Harbour development (see de Albuquerque, 1991) and the extensive beach and water related activities at Jolly Beach Hotel (now Club Antigua). The spillover effects of these activities are felt as far as Cades Reef through significant numbers of inexperienced snorklers on glass bottom boat excursions. When the marina at Jolly Harbour becomes fully operational, there will be the additional pollution from the recreational marine facilities. Already, the water in Lignum Vitae Bay has occasionally a distinctive diesel/gasoline smell.

Even east coast beaches in the Willoughby, Nonsuch and Mercers Creek Bay areas are under threat from current or proposed tourism and residential development. In point of fact, few beaches on Antigua or even on the more accessible offshore cays have been free from the heavy imprint of non-sustainable human activities.

Barbuda, because it is fairly remote and less dependent on tourism, has fared much better. But even here some beaches and shoreline areas are showing evidence of erosion and other intrusions. At Dulcina, the Landing, and Palmetto Point there is significant erosion (see Table 14). Even beautiful Low Bay has litter left over from daytrippers as has Two Feet Bay on the East coast. While most of the East coast beaches are pristine to near pristine, they all have cruise ship and other debris cast ashore by swells and the occasional storm. Nevertheless, they remain among the most pristine beaches in the Caribbean, very much in need of "park" or "protected area" designation.

### Salt Ponds/Mangrove Areas

In the 1980s it was estimated that wetlands in A/B constituted

about 11 percent of the total land area or about nearly 5,000 hectares, with Barbuda having the larger proportion (de Albuquerque, 1991). These wetlands consist largely of salt ponds and adjoining mangrove swamps, both rich in delicate habitat and species diversity. Salt ponds and mangrove areas in A/B are being destroyed/lost at an alarming rate, primarily due to tourism development, and some of the island's unique flora and fauna are seriously endangered. What makes Antigua's salt ponds/mangrove swamps particularly attractive for tourism development is that often associated with them is a strip of sandy beach. The land adjacent to the beach is usually too narrow to accommodate a major tourism resort complex, so when these areas are slated for development, part, or the entire, pond/swamp is filled in. Until 1988 there was little public concern voiced over the development of wetlands, nor was there much awareness of how valuable mangrove swamps/salt ponds were as nurseries for fish and crustaceans and as wildlife habitats. Indeed, these mangrove swamps/salt ponds have long been used as garbage dumps and assumed to have only nuisance value.

Table 10 shows the extent of loss of mangrove swamps and salt ponds. Both Ballast Bay and Deep Bay salt ponds have been lost because of development activities in relationship to the Royal Antiguan Hotel (now Ramada Renaissance). Some parts of the Flashes have been reclaimed, large areas of mangroves have died, and much of the grasses and weeds have disappeared. We suspect that this is due to the dumping of toxic and other wastes at Cook's dump. Other mangrove areas/salt ponds have also been destroyed in the last 6 years--at Jolly Hill, Carlisle Bay, and Emerald Cove, all as a result of tourism development. The destruction of the Jolly Hill saltpond/mangrove area and its subsequent impact, is detailed in de Albuquerque (1991). Currently the salt pond/mangrove area at Darkwood is being systematically destroyed through clearance of the adjacent area for road expansion and a yet undisclosed development. There are several other salt ponds/ mangrove areas that require close monitoring, namely Crab Hill, Yorks, and MacKinnons, to ensure that they do not go the way of Jolly Hill or Carlisle Bay. Mackinnons has already experienced severe environmental pressure, first from several oil spills in the 1970s from the now abandoned Occidental Petroleum Refinery, and more lately the discharge of raw sewage from hotels and the dredging and filling in of the northern end of the pond.

### Harbours

Antigua's harbours are in trouble. Table 11 provides some assessment of the main problems. St. John's harbour is extremely polluted from sewage, industrial and chemical waste, solid waste, etc. In fact, divers searching for old bottles and other artifacts indicate that there is very little marine life and the bottom muds are foul smelling. Continuous dredging activity has also resulted in considerable suspended sediments, and large plumes of suspended

sediment can be seen during periods of heavy rain extending out of St. John's harbour to West Channel and Sandy Island Channel. One of the major problems contributing to the dreadful conditions of St. John's harbour is the lack of a sewerage system for the city of St. John's.

English Harbour also suffers from some of the same problems, sewage from yachts and solid waste dumping, but to a lesser extent. Deep Quadrant (1989) divers reported a lot of debris on the bottom, including bottles, bottle tops, cans, batteries, tires etc. Given the importance of English Harbour to Antigua's tourism, it is critical that all yachts be required to have holding tanks, and that better monitoring of littering overboard and dumping from land, takes place, especially during the annual "Race Week". This also applies to Falmouth Harbour. In addition, it is imperative that some mooring regulations be put into place, designating mooring areas and requirements.

In Barbuda, the area around Codrington jetty is experiencing some pollution and dumping, and this needs to be carefully monitored as the Codrington Lagoon is one of the largest in the Caribbean and an extremely important habitat for fish, crustaceans, bird life and other wildlife. The northern part of Codrington Lagoon has one of the largest Frigate Bird colonies in the Western Hemisphere and offers significant potential for local well managed eco-tours.

### Reefs

Weiss (1989) notes that between 1941 and 1981, Antigua's fringing reefs, particularly on the north and northeast coasts, have diminished in size and in the abundance of coral and sea grasses (see Table 12). He associates these changes to coastal and marine development, most notably, dredging, the construction of ramps and docks, tourism and residential development on beaches and cliffs, and the discharge of raw sewage and other pollutants. A Reefwatch study conducted by the Deep Quadrant team in 1989, concluded that for the most part Antigua's reefs are in reasonable shape, but it cautioned against the detrimental effects of uncontrolled tourism on reef ecosystems.

Bunce's more recent study (1994) indicates that the reefs are being significantly degraded as evidenced by low coral species diversity and abundance, low fish populations, increasing sediment levels, and moderate to high algae abundance. Bunce concludes her report with the following recommendations (in addition to continued monitoring of reefs): "regulate fishing in order to reduce algae growth; investigate sewage outfall sites...; instigate a user fee on divers and snorkelers...; install mooring buoys to reduce anchor damage; limit land run-off and sewage disposal...; and increase diver awareness to reduce diver damage" (Bunce, 1994:31). We might also add the need to control spearfishing and indeed ban it from

certain reefs, to control fish traps and mandate the use of natural materials to construct them, and to monitor the discharge of sewage and all other pollutants and wastes into the coastal waters. Given the high value of reefs to A/B fishing and tourism industries, the implementation of all these measures is essential.

The fringing reefs in Barbuda are in significantly better condition although they do show some visible human impacts--most notably from fish traps and spearfishing (see Table 14). While not overfished like Antigua's reefs, reef fish populations in many of Barbuda's reefs are low to moderate. Coral species diversity is low to moderate, while coral abundance appears to be moderate. Algae species diversity and abundance is generally low. Lobster pots and fish traps ring Barbuda, and fishermen have been complaining for years about significant declines in their catches. Most of the lobsters caught in Barbuda's waters are immediately bought up and flown to St. Maarten, Martinique and the Virgin Islands. Even Palaster Reef, which has protected status, was observed to have lobster pots by Deep Quadrant divers. The Reef Quality Index established for this reef by the divers "falls within the general pattern observed for Antigua reefs" (Deep Quadrant, 1989).

### Offshore Islands

With the exception of Long Island and Sandy Island, Antigua's offshore islands are all near pristine--they show some (minimal) evidence of human impacts, in the form of litter left behind by fishermen and daytrippers, and the occasional poacher (birds eggs, turtle eggs, etc.).

Long Island is dominated by the tasteful and well laid out Jumby Bay Resort, and the resort must be commended for its environmental awareness, particularly, its assistance with a turtle monitoring and conservation project. Sandy Island is the second most heavily dived site in Antigua, being visited by an estimated average of 107 divers/snorkelers a week, not to mention a number of local fishermen who spearfish and/or set fish traps around the island (Bunce, 1994). There is a lot of litter left behind on the island from daytrippers and fishermen, and the island shows the imprint of heavy human visitation.

Most of Antigua's offshore islands need some kind of protected status since there are several potential developers waiting in the wings. Guiana Island, for example, is being targeted by the Antigua Government for development, and Cabinet is just waiting for Taffy Bufton, the eccentric Englishman who lives on the island and vigorously protects its wildlife (especially the deer), to die. Crump Island is also slated for development, and currently there is a private effort underway to establish a marine park there. There are also some concerns, that because these two offshore islands are so close to Antigua, that they may someday be connected by causeway

rather than ferry. Bird Island is also being considered as a site for a proposed marine park to be managed by the National Parks Authority. The preliminary plan for this has been funded by the Organization of American States (OAS).

### **THREE: NGOs AND STATE INSTITUTIONS INVOLVED WITH COASTAL RESOURCE MANAGEMENT**

#### **State Institutions**

There are several governmental agencies in Antigua that are responsible for the management of coastal resources. The National Parks Authority is responsible for the management of the Dockyard National Park, Monk's Hill, Halfmoon Bay, and several other areas under development. The Public Works Department has the responsibility for enforcing the Beach Protection Act on 1957 (see Table 15), which prevents removal of sand and aggregate from beaches and foreshores. The Central Board of Health (CBH) is responsible for the collection and disposal of solid and liquid wastes and for enforcing sanitation laws. The Port Authority is charged with managing the ports/harbours. The main responsibility for managing the coastal resources, however, belongs to the Ministry of Agriculture, Fisheries, Lands and Housing. Within this Ministry, the Fisheries Department is charged with protecting the marine resources, the Lands Division with the management and control of Crown (Government) lands, and the Development Control Authority with the overall monitoring and control of all development and construction. In fact, from a statutory standpoint, Antigua has all the necessary laws (see Table 15) and institutional framework to effectively manage and monitor its coastal resources (for a more detailed description see CEP, 1991).

While Barbuda comes under the ambit of various Government Agencies and is subject to the same laws and statutes, technically the island is, through the **Barbuda Council**, internally self-governing. While the **Council** in theory is entitled to make by-laws and in general control development in Barbuda, in practice it has been able to exercise very little control over its resources. The Antigua Government (GOAB), and specifically the Cabinet, has routinely made decisions affecting Barbuda without input of the Council, to wit, leasing the rights to mine sand or to develop land. The GOAB's justification is the claim that much of Barbuda is Crown land. Barbuda's relationship vis-a-vis the national government is the subject of a protracted legal dispute. Currently the sand mining operation have ceased because of a temporary injunction issued by the Courts (for additional details see CEP, 1991:176).

The operation of these various agencies and regulations in managing A/B's coastal resources, however, has been largely ineffective. Take the Department of Public Works which is

responsible for protecting beaches from illegal sand mining. This Department has no real enforcement arm and no personnel willing to enforce the Beach Protection Act of 1957. Only the remotest beaches in Antigua have escaped illegal sand mining. In fact, sand mining continues at Dry Hill (Runaway Bay), Ffryes Bay, Pearn's Bay, Hermitage Bay and elsewhere, in broad daylight and often within view of DPW trucks and GOAB officials. The reasons why GOAB turns a blind eye to illegal sand mining operations are explored elsewhere in this Report.

The **CBH** does an equally poor job in terms of enforcement of various sanitation laws, and an inadequate job in terms of solid and liquid waste collection and disposal. The latter is largely due to an inadequate budget and an antiquated waste disposal system which is attempting to deal with a problem of major dimensions since the modernization of the Antiguan economy has resulted in a quantum increase in garbage, construction waste, industrial waste, etc. Solid waste, from litter, to construction waste, junked cars, car tires, batteries, etc. is strewn all over the island, sometimes right in front of **DPH** signs prohibiting the dumping of rubbish. Gone are the litter wardens of earlier times or the community awareness and pride that was so much in evidence.

Perhaps the most important agency in terms of protecting A/B coastal resources, and the agency that has had the least authority, is the **Development Control Authority (DCA)**. This agency has been and is routinely bypassed by developers and even regular citizens, who simply take their construction/development plans directly to Cabinet. When the **DCA** has attempted to exert its authority its Director/Acting Director has often been pointedly informed by Cabinet not to interfere. The **DCA** has also been hampered by an inadequate and poorly trained staff. Through much of the construction boom period in the late 1980's there were only two building inspectors in Antigua. It has also tried to operate without a National Development Plan. A draft plan was prepared in 1976 but no plan as yet has been approved by Government. The problems of development control in A/B are reviewed in great detail in the CEP (1991).

While many GOAB Agencies tend to have overblown staffs, they invariably lack persons with appropriate technical skills, who are quickly lured to the private sector. Those that stay on in Government, say in the **Fisheries Department** or **Forestry Division'** are terribly overburdened with routine matters and consequently underutilized. There are a number of highly trained persons in the area of resource conservation frustrated by the lack of equipment, support staff, and so on. Thus the institutional framework that exists with respect to managing coastal resources is essentially non-functional, and likely to remain so, because the Government's consistent preference for quick short-run economic pay-offs over long-run environmental stability and slower-paced growth.

In 1989, The GOAB bowing to pressure from the Historical and Archaeological Society (**HAS**) and the newly formed Environmental Awareness Group (**EAG**), and especially to radio and television interviews given by E.T. Henry the driving force behind this group, established the **Historical, Conservation and Environmental Commission (HCEC)**. The **HCEC** has no statutory authority and has no clear mandate, other than to demonstrate the Government's concern for environmental issues and to represent the Antigua Government in environmental forums regionally and internationally. The current Chairman of the **HCEC**, Eustace Hill, is the owner of an industrial gas business. He succeeded the former Chairman Oscar Bird, who has close links to the ruling Bird family. The Commission does have members with strong environmental credentials, such as Desmond Nicholson and E. T. Henry, both with the Museum of Antigua/Barbuda; but the Commission meets so rarely that these members have very little opportunity to voice their concerns. In the minds of many environmentalists in A/B, the Commission is simply window dressing, given increasing environmental awareness in the region, by a Government with a very poor record of protecting the environment.

The **St. John's Development Corporation** was established by an Act of Parliament in 1986 on the recommendation of the **OAS**. Its primary objective is to promote the revitalization of St. John's. To this end the Corporation has been involved in a number of ventures/projects--the Heritage Quay Project (Duty Free Shopping), the Marina Bay Project, a Heritage/Historic Preservation project which through the help of **OAS** architect Eduardo Rojas has identified buildings of historical and architectural significance, and proposed the Market Esplanade project to revitalize the market area and East Bus Station. With the exception of the Heritage Quay Project and the Marina Bay Project at Runaway Bay, both of which have been fraught with problems (Italian contractors, equipment, materials, imported workers, inappropriate technology), the Corporation has been able to do very little to revitalize St. John's. Despite several **OAS** studies for street improvements and the reorganization of traffic patterns, the city is inhospitable to pedestrians and has a major traffic and parking problem.

The city also has a major liquid and solid waste disposal problem. Open sewers flow directly into St. John's harbour. Solid waste lines the streets and it is dumped in gutters, around the harbour shoreline and everywhere possible. Street sweeping and washing is often impossible to undertake. The Corporation has attempted to work with local businesses to keep sections in front of their businesses clean and to make sure rubbish bins are available and emptied frequently. The Director of the Corporation, a thoroughgoing professional named Winston James, like many other professionals in Antigua, has often found his hands tied and is frustrated by the low priority GOAB has given to constructing a sewerage system (estimated construction time 3-7 years) for St. John's, and to cleaning up the city to make it more attractive to

tourists and residents alike.

There is one other organization that has the potential to positively shape the GOAB's environmental policy. The **Women's Directorate/Desk**, headed up by the influential, Gwendolyn Tonge. Unfortunately, after initial support of the **Antigua Clean As A Whistle** campaign, the group has seemingly backed away from environmental issues.

### Non-Governmental Organizations

The earliest NGO to have a decided impact on the management of Antigua's resources, in this case historical/cultural, was **The Friends of English Harbour**. An eclectic organization of mostly expatriates who had settled in Antigua, this organization must be recognized for its work in protecting and preserving **Nelson's Dockyard** and **Shirley Heights**, for eventually convincing the GOAB of this important national treasure, and for widely publicizing the tourism potential of English Harbour. Much of the credit must go to the Nicholsons, especially Desmond and Lisa Nicholson, because it was through their efforts to promote park status for the Dockyard that the National Parks Act of 1984 was enacted, and subsequently a Park Development Plan and Park Management Plan drawn up with assistance from **CIDA**. Having accomplished its goal, **The Friends of English Harbour** disbanded, although many of its former members continue their participation in the Nelson's Dockyard Foundation and the **Historical and Archaeological Society (HAS)**.

The Antigua Archaeological Society (**AAS**) was the predecessor of **HAS**, which was established in 1965. Credit again must go to Desmond Nicholson for keeping **HAS** together and for all his research into A/B's early history. Nicholson's work and research achieved national recognition when GOAB provided support to the **Museum of Antigua and Barbuda** in 1986 with help from UNESCO and CIDA. **HAS** has about 100 members, both local and foreign. It publishes a quarterly Newsletter, sponsors numerous field trips and lectures, helps mount exhibitions at the Museum, is actively involved in the Museum's educational program, and devotes a lot of energy to the preservation and conservation of historic sites and objects. However, since Antigua lacks a National Trust, the responsibility of protecting historical/cultural resources has fallen to a number of agencies who have different mandates and who lack the necessary interest and technical expertise.

Consequently, residential, industrial, infrastructural and tourism development has and continues to destroy A/B's prehistoric and historic sites, despite the fact that **HAS** has made a very comprehensive inventory of sites available to the **DCA**, the **HCEC**, and the **National Parks Authority**. As an NGO all **HAS** can do is to publicize destruction when it occurs and engage in highly visible archaeological salvage operations as they did at the Emerald Cove development in Muddy Bay or at Coconut Hall. This does serve a

useful purpose since it alerts regional and international organizations to the problem. The **Organization of American States** for example, has undertaken a number of studies in Antigua, particularly related to preserving historical sites in St. John's and now more recently Parham. Unfortunately, the recommendations from these studies have all been shelved and St. John's continues to lose properties of historic significance to commercial development.

It is because **HAS** has not been able to significantly influence GOAB's development policy, that its sponsorship of the **Betty's Hope** project becomes all that more important. When completed the project will have restored several windmills and will have installed mill machinery to create a replica of what the estate looked like in its heyday. **Betty's Hope** has already become an important site for tourists and local visitors, a clear example of the economic, socio-cultural and educational benefits that would accrue if such heritage sites were emphasized by GOAB policy and appropriate resources made available for their protection. However, private efforts pressing for public support to save sites like Montpelier Estate and Fort James remain unheeded. Currently, erosion produced by dredging and other activities in St. John's harbour has produced a huge crack in the Fort James' sea wall. The wall and other areas of the Fort need to be shored up, but thus far Russel Hodge, who has a lease on part of Fort James, has been unable to secure GOAB assistance.

Two organizations in the private sector require special mention--the **Antigua Hotel and Tourism Association (AHTA)** and the **Chamber of Commerce and Industry (CAIC)**. The **AHTA** is an organization established by hotel owners to promote the tourism industry. The organization is governed by an Executive Board and the day to day operations are entrusted to a manager. Member hotels pay graduated fees based on the number of rooms. In return they are provided with listing in the **AHTA** directory, cooperative media advertising, displays at the airport, bargaining with unions etc. Some of the **AHTA's** major concerns are the tourism infrastructure (particularly the airport), the British Airways deal which virtually shut out other airlines from operating between Antigua and the UK/Continental Europe, the high cost and unreliability of electricity and water, and the Government's apparent lack of a tourism master plan.

The **AHTA** has been a very vocal critic of the various GOAB tourism ventures, particularly the Royal Antiguan, which was built almost entirely by Italian workers and benefitted few local contractors and suppliers. In 1989, in reaction to Cabinet's policy of making beach lands available to the highest bidder, the **AHTA** commissioned a "Strategic Plan" envisioning who the likely loser and winners would be in 1995-98 in the competitive Caribbean tourism market. Antigua was projected to be a likely loser because of overbuilding of accommodations, the trend towards mass tourism,

deep rooted environmental and infrastructure problems, excessive pricing to meet costs, all of which were projected to cause a decline in the visitor experience. The **AHTA** because of its interest in maintaining a quality product is very much aware that protecting and properly managing Antigua's coastal resources is the key to the industry's long term success. In fact, **the AHTA** is on record in opposing the kind of tourism development that has taken place in Barbados where massive concrete structures along the coastline have blocked visual as well as physical access to beaches/coasts. On several occasions **AHTA** president Charles Hawley has called for an official investigation into the misappropriation of public funds by GOAB ministers.

The **CAIC** has also opposed the current tourism development policy GOAB is pursuing and has decried the numerous "sweetheart" deals with Italian and other developers. The **CAIC** has issued press releases critical of the GOAB's local and foreign debt, the number of business licenses being issued to foreigners and the extent of corruption, mismanagement, and poor public accountability. Even the Private Sector Organization (**PSO**), which represents a number of different business organizations and has maintained a low profile, was finally driven to request a meeting with Cabinet in 1992 to address the issue of widespread corruption in the country. All of these organizations have powerful members, and they cannot be ignored when attempts are made to pressure GOAB to adopt a national development plan that will promote sustainable tourism.

The Churches, particularly through the **Antigua Council of Churches**, have also played an active role in mobilizing citizenry against Governmental corruption and the destruction of the environment. While the Churches and Ministers have focussed most of their attention on corruption, particularly Governmental involvement with prostitution (women from Santo Domingo brought in to such night clubs as Bruce's, Skells, and the Stables), they have also preached against the ongoing ecosystem destruction and have helped promote environmental education among youth (Cathy Ann-Tonge of the Catholic Presbytery). As a very significant force in the life of many Antiguans, the Churches have been able to bring out thousands of people to protest against GOAB corruption. The Government has on occasion made threats to deport some Church leaders like Bishop Reece, a Jamaican Catholic bishop.

There are several other **NGOs** that have played some role in promoting coastal conservation, such as the **Humane Society** (protecting wildlife, particularly on the Off-shore islands) and local community groups such as the **Fitches Creek Community Association**, which generally mobilize to deal with specific problems impacting their respective communities. However, it is the **Environmental Awareness Group (EAG)** that has had the most success in bringing environmental issues to the forefront.

**Environmental Awareness Group (EAG)**

The life history of the **EAG** provides a useful case study of the environmental movement in A/B. In 1988, a number of **HAS** members concerned with the continuing destruction of A/B's coastal resources through tourism and related infrastructural and residential development, organized the **EAG** to raise public concerns about the environment. Among this group were people like E. T. Henry, the Curator of the Museum, Desmond Nicholson, the Museum's Director, Winston Derrick a businessman, Brian Cooper of **CARDI**, John Jurgensen who is overseeing a restoration project in Rat Island, and some retired expatriates. While the Group operated out of the Museum, and continues to do so, it was loosely organized and had no formalized membership or funds. However, in January of 1989, a constitution was accepted and the election of officers took place.

The first few monthly meetings were sparsely attended but a series of environmental disasters later in the year, including the fish kill at McKinnon's swamp (de Albuquerque, 1991), brought environmental issues into the public's consciousness and provided a wider forum (newspaper, radio and television) for the group to publicize its concerns. These included a long litany of environmental abuses--the pumping of raw sewage into Mackinnon's and the sea by hotels, beach sand mining, coral harvesting, destruction of mangroves, the filling of salt ponds, the clearing of hillsides, the destruction of shoreline vegetation, solid waste dumping and so on. With the help of one of the author's of this report, proposals for funding the activities of the **EAG** were drawn up and submitted to a number of regional organizations. **Island Resources Foundation (IRF)** provided a preliminary grant to help organize the **EAG** and provided a consultant to help develop an "Institutional Development Plan". Within short order the **EAG** was up and running.

One of the **EAG's** first activities was to help sponsor the **Antigua Clean As A Whistle Campaign**. This was followed by an environmental education program, exhibits in the museum, a membership drive, lectures, preliminary planning for Earth Day and for publishing a Newsletter. By the beginning of 1990 the **EAG** had become firmly established, and **EAG** members had begun making contacts with local businesses and with senators who they knew were sympathetic to environment causes. Two **EAG** members were appointed to the **HCEC**. The **EAG** was also designated the host NGO to oversee and assist with the development of the **IRF/CCA** Country Environmental Profile.

The **EAG** has been fairly successful in its environmental education program. School children have come to view environmental exhibits at the Museum, students have attended **EAG** field trips, and much energy has gone into impressing upon teachers the importance of introducing an environmental component (required by the **CXC**) into the syllabus of some course. At Antigua State College future teachers are being exposed to environmental studies. The **EAG** also

maintains an adequate library that is open to students doing school projects and to the general public. The organization has frequently provided in-kind support to a number of researchers working on environmental issues in the country.

Since 1990 the **EAG** has obtained contributions and grants from a number of local individuals and businesses, the **Caribbean Conference of Churches (CCC)**, the **Caribbean Conservation Association (CCA)**, **IRF**, the **Nature Conservancy**, the **Pan American Development Foundation**, the **Atlantic Center for the Environment**, and so on. It has expanded its activities into many areas--agroforestry projects, environmental education (in the schools, public lectures, media programs etc.), a youth agenda, a biodiversity project and a coastal and marine resources project (plant specimen collection, biological monitoring, wetlands monitoring, coral reef monitoring). All this is in addition to sponsoring Earth Day, World Environment Day, plant sales, poster competitions, organizing recycling efforts etc. One of the most promising **EAG** programs is the "Youth Agenda", whose main goal is to interest that hard to reach group of persons aged 17-35 to take an active role in protecting their environment. This program is being ably led by Kevel Lindsay, a Forestry Officer, and recipient of **IRF's** 1993 Euan McFarlane Award for outstanding young Caribbean environmentalist of the year. He is assisted by Cathy Ann-Tonge.

By all measures, the **EAG** has been remarkably successful. It has operating programs and projects, has a functioning office, support from members and some local businesses, an informative newsletter, fund-raising activities, a successful record managing grants, wider recognition in the region and elsewhere, and yet it has failed to impress upon the political directorate that environmental concerns must weigh heavily in all development decisions. A recent issue of the Newsletter (**The EAG'er**--April, 1994) in discussing the "Youth Agenda" begins by noting:

"Our country is in a terrible crises. Our very lives are at stake. The degradation of our environment, lack of consultation and consensus, social stagnation, poor communication and information transfer all add up to a growing mountain of environmental and social problems..."

### Local Business Effort

Some businesses also deserve specific mention for their efforts to assist environmental causes. The **Body Shop**, following founder Anita Roddick's well publicized environmental awareness, helped sponsor the **Antigua Clean As A Whistle** campaign. Other organizations like **Benjies**, **Lee Wind Paints**, **Antigua Masonry Products** and **Antigua Aggregates** (both Lester Bird companies), etc. have also contributed to environmental efforts through in-kind

support (e.g. printing) or the provision of rubbish containers.

#### **FOUR: LOCAL AND REGIONAL CONTEXT**

In the local context, this section examines the relative openness of the media, the power balance in Government, the extent of coastal legislation, monitoring and enforcement, and institutional effectiveness in an atmosphere of aggressive tourist promotion. In the regional context, the position of A/B is identified across the tourist destination life cycle along with 20 other small tourist-dependent Caribbean islands (1) to broadly gauge the level of environmental intrusion, and (2) to highlight the need for coastal conservation. The role of regional organizations is also reviewed.

##### **The Local Context**

In A/B, Government and the ruling political party (ALP) control the local TV station (ABS), Cable TV, and both radio stations. A/B lacks a daily newspaper, and the weekly newspapers are generally uncritical of GOAB, with the exception of The Outlet. The Daily Observer, run by **EAG** and **HAS** member Winston Derrick, made its debut in 1993 and is the closest thing to a daily newspaper, but it has a minicule budget and distribution problems. Nevertheless, it has become a thorn in the side of the GOAB.

In addition to Government's controlling influence over the local media, it has also been somewhat successful in controlling the importation of print materials critical of the islands. For example, certain books have been banned--Robert Coram's Caribbean Time Bomb and Jamaica Kincaid's A Small Place--and editions of newspapers/magazines critical of the Bird regime. But these publications still circulate in Antigua, and special reports like the March 1994 series entitled "Antigua: Corruption, Inc." by Melvin Claxton of The Virgin Islands Daily News, do make it to bookstore shelves despite clumsy attempts by the ruling political party to buy up all the issues.

The regional press, and especially papers like ECNews, Caribbean Week, CANA, and The Chronicle (St. Maarten) have very little coverage on Antigua. However, there is a common consensus in the region that Antigua is a hotbed of corruption.

Although Government heavily influences the media, in a small island where everyone knows everyone else and people are related, it is very difficult for Cabinet to conduct its business in perfect secrecy. Leaks are common and are sometimes deliberate given the political infighting that often erupts. As a result of the intense personalism and accessibility characteristic of small island society, the man on the street is acutely aware of scandals involving public officials, who the latest foreign adventurer is on island, and so on. In this way, Government's control of the media

and the inflow of off-island information is routinely mitigated.

### Inter-organizational Power Balance

Political power is held by Cabinet, and in particular the Bird family, even though the mantle of leadership has passed from Vere Bird, Sr. to his son Lester. This was especially in evidence recently. The splintered opposition which finally came together under the banner of the United Peoples Party (UPP) to contest the March 1994 election was widely expected to win given the high level of discontent in A/B. But all of the rallies against corruption, the round-island motorcades, and the opposition to the Bird regime by most NGOs (AHTA, CAIC, PSO, Antigua Council of Churches) could not stop the Bird regime's return to power. These results underscore not only the overwhelming strength of the ruling ALP and its history of successful patronage, but also the current fragility of the A/B economy. In times of uncertainty, people vote their pocketbooks: better a known quantity, albeit corrupt, that can deliver, than an inexperienced team preaching the need for morality in government.

At some level, the various NGOs, the opposition, and the Judiciary have managed to curb some of the worst environmental excesses. Nonetheless, GOAB has operated fairly unfettered by its own laws, by Commissions of Inquiry, and by at times a critical media. The Judiciary, although fairly independent, has been relatively timid in taking on Government. Even the most vocal critics, including some prominent environmentalists, have been fairly careful not to overstep their bounds. Such restraint among opposition forces suggests a certain climate of caution and fear of reprisals, and underlines the imbalance of local power and the absence of viable checks and balances.

### Legislation

Table 15 details specific statutes designed to protect the environment in general and coastal resources in particular. These laws, spanning from 1900 to 1986, belie a consistent historical legal tradition in conservation embracing everything from fishery regulations, beach protection and biodiversity to forestry ordinances and national park legislation. There are notable lacunae: the lack of an approved land-use plan, the absence of a comprehensive tourism plan, and no coastal zone management program that would integrate water-dependent commercial and residential siting and construction with the physical capabilities of A/B's richly endowed coastal regions. There is also need for a water use plan, a watershed protection plan, and serious consideration given to extending protected status to remaining mangroves and coastal areas rich in prehistorical and cultural artifacts (CEP, 1991).

However, recent history has documented that coastal

conservation has foundered not only on the shoals of missing legislation but moreso on an inadequate regulatory regime in general and the lack of enforcement in particular. Ecological preservation has been consistently overshadowed by the imperatives of laissez-faire rapid tourist/construction growth. While this policy of neglect may have been understandable during the 1970s and 1980s when the agricultural sector was being restructured and new manufacturing was expanding, it must not continue for two reasons. First, policy-makers can no longer ignore the irreversible harm of past unbridled growth along the coastal and wetlands zone. Ruined mangroves/salt ponds, eroded beaches, and damaged reefs testify to these long-term losses.

Second, the current stagnation in agriculture, fishing and manufacturing indicate tourism will be the only viable sector over the next decade. Unless the special natural and other assets are carefully managed along the coastlines where tourism properties and activities are concentrated, A/B's economic future is in jeopardy. In general, this means GOAB must no longer by-pass DCA scrutiny. In particular, it demands of developers mandatory environmental impact assessments (EIAs), mandatory sewage treatment plants for large-scale facilities, appropriate set-backs, land and vegetation removal mitigation procedures and so on. Such a reversal in policy at this critical juncture, as exemplified by enforcing existing codes, is more significant than the creation of new legislation.

### Institutional Effectiveness

Closely related to failed legislative enforcement, and in addition to fragmented and sometimes unclear resource oversight responsibility, there are few internal mechanisms in place to monitor institutional effectiveness. For example, it is commonly alleged that GOAB's record of revenue collection is weak partly because there has been no published audit of public finances for many years. Likewise, it is difficult to judge the status of terrestrial and marine resource quality and the effectiveness of management strategies because of the absence of systematic benchmark data and monitoring.

Recent attempts to fill this vacuum are hampered by the lack of funds, equipment, and personnel. These initiatives are often fragile, piecemeal, and shoestring and poor instruments for capturing the kinds of long-term baseline data needed for fashioning sustainable development. For example, Diann Black of the Fisheries Department, with the assistance of **EAG**, is trying to establish a reef monitoring project using volunteers such as dive operators and outside researchers (usually American graduate students). The **Forestry Division** and the **EAG** are attempting to promote reforestation schemes, but for every tree they plant, scores are cut down, hillsides bulldozed, and whole watersheds irreversibly damaged to make room for resort developments. These efforts are further hampered by high frustration and turnover rates

among skilled professional in the public sector, in part a natural consequence of GOAB's low priority for environmental concerns.

### The Regional Context

This regional overview presents the gestation of A/B's tourism experience and its recent performance in the context of the small-island Caribbean. It also examines NGO linkages with regional environmental and donor organizations and their potential influences in Antigua.

### Tourism Dependence

Antigua and Barbuda share with their West Indian neighbors a long legacy of colonial monoculture, emancipation and emigration, postwar political evolution, and economic restructuring. The key contemporary contour shaping the region is tourism dependence. Historically, a relatively affluent low-density long-staying industry spread from Bermuda, Bahamas and the Greater Antilles to the Leewards--USVI, St. Maarten, Antigua--with the closure of Cuba to US visitors in 1960. As a result of the favorable confluence of jet travel, foreign hotel investment, and the construction of aid-financed transport infrastructure, tourism has now penetrated the Windwards, and the structure of the industry has shifted in the mature destinations towards the high-density, shorter-staying, mass market style (Seward and Spinrad, 1982).

According to Table 16, tourism has grown and matured significantly in A/B during the past two decades. Over 70 percent of the approximately 3,500 hotel/apartment/guest house rooms today were constructed since 1970. Almost half were added since 1980. Gross visitor expenditure more than tripled in the 1970s and rose nearly six-fold since 1980. Over the same decade, the number of cruise visitors overtook the number of stayover tourists. In addition, the origin distribution of stayover tourists stabilized, another indicator of increasing industry maturity. Presently, Antigua's major overnight market shares include 45 percent from North America, roughly 20 percent each from the United Kingdom and the Caribbean, with most of the balance from the rest of Europe (CTO, 1993).

In the context of other small-island Caribbean tourist destinations, A/B is one of the most developed areas. Table 17 presents visitor data on 20 small British, French, Dutch, and U.S. Islands. The table also computes average daily visitor densities per 1,000 population from stayover, cruise and average visitor stay figures as an indirect test of Butler's (1980) destination life-cycle model.

Results discriminate roughly between three groups of islands clustered into three different levels of tourism penetration. These include the older, high-density, mass market **Stage III**

destinations with daily densities above 100 visitors per 1,000 population like Aruba, Bermuda and St. Maarten. Second, at the bottom are the newer, low-density, long-staying **Stage I** islands with densities less than 40 visitors per 1,000 population like the Windwards: Dominica, Grenada and St. Vincent. In the middle is the Intermediate or **Stage II** group with densities between 40-100 visitors per 1,000 population.

A/B falls at the upper end of this transitional group with 90 visitors per 1,000 population. This means that in 1992 the daily tourists on-island augmented the resident population by nearly 10 percent. Given Antigua's already high density and the pressure on its urban and coastal resources, this can be considered a critical increase. A/B is part of a subset of expanding **Stage II** islands like Anguilla, Bonaire, and Turks & Caicos that, if current growth continues, are on the verge of joining the most established, high-density **Stage III** destinations as two of its previous neighbors--the BVI and Cayman Islands--seem to have done very recently (see de Albuquerque and McElroy, 1992). In addition, A/B's visitor densities now rival the fastest growing tourist-dependent islands in the Pacific like the Northern Marianas and Guam (McElroy and others, 1993).

The significance of Antigua's high boundary position along the resort cycle is three-fold. First, it suggests the style of local tourism is changing inexorably towards the high-density mass-market practice of the regional leaders. This shift is already evident in the increase in facility scale and foreign control, slower overall growth, and the expansion of man-made attractions (shopping) to replace lost or degraded natural/cultural assets. Second, it suggests further environmental alterations since **Stage III** islands provide the most documented cases of tourist-intrusive coastal damage. In Antigua for example, it is estimated that during the 1980s, more mangrove swamps and off-shore reefs were damaged or killed than in all its previous history (Corma, 1993:168). As a result, Antigua's transformational style of large-scale beachfront resort/marina complexes seriously endanger the island's biodiversity (CEP, 1991). Finally, it calls for a serious halt to policy-as-usual if damage to short-run tourist growth is to be avoided--crowding and declining visitor stay and repeat visitation--and certainly to arrest the long-term erosion of a quality tourism experience.

### Informational Systems and Networks

Word of mouth, newsletters, press releases, handbills, signs, demonstrations, meetings, and public fora are all ways by which information on environmental issues is disseminated in Antigua and throughout the region. There is a large network of people dedicated to environmental concerns often working in sympathetic organizations with offices in Antigua (**CARDI**, **OECS**, etc.) or in "green" businesses (the **Body Shop**) or simply retired (**EAG**), with

strong off-island links. For example, the **EAG** has established good working relations with the **Nevis Historical and Conservation Trust**, the **St. Christopher Trust**, **The Montserrat National Trust**, and other similar organizations in other islands. Through these linkages environmental problems in A/B have been publicized in the Eastern Caribbean. But these islands are also absorbed with their own problems of beach sand mining, beach erosion, nonsustainable tourism development and so on.

### Regional Organizations

The record of success for regional institutions involved with environmental issues in Antigua is modest either because of the lack of leverage or because of the small scale of their involvement. For example, when powerful trade organizations like the **Caribbean Hotel Association** are unable to impress upon GOAB the potential unfair competition they face from cruise ships, NGOs devoted to environmental causes have little chance of promoting their agenda. Typically, island governments have responded by capitalizing on growth in the cruise industry through building larger cruise ship terminals and more extensive duty-free shopping complexes. This has placed further pressure on A/B to follow suit, irrespective of the ecological consequences.

The **Caribbean Conservation Association (CCA)** is an old and respected organization, but it has very little political internal leverage. CCA's membership structure, which includes various island governments, precludes it from taking an active political stance criticizing respective members for their policies. During the 24th Annual General Meeting of the CCA, this issue came to a head with many NGO members claiming that the organization must begin to play a more forceful political role even if it means restructuring its membership.

**Island Resources Foundation (IRF)**, because it has no affiliation with any island government, is better placed to take an environmental advocacy role, but it too is circumscribed in how vocal it can be. If outside agencies forcefully address the political realities of A/B and appropriately blame the political directorate for environmental degradation, they run the risk of alienating the regime and losing their voice and effectiveness in the future. This partly explains the softer approach taken in the IRF/CCA Country Environmental Profile on Antigua-Barbuda (CEP, 1991). However, although it has been distributed to most all government agencies, and although it is occasionally mentioned in the EAG Newsletter and The Daily Observer, few of its long list of recommendations have been considered or implemented.

This experience brings into question the new environmental concerns of donor agencies like the **CDB**, **World Bank**, **USAID**, the **EEC** (Lome aid), **CIDA**, **OAS**, etc., and the effectiveness of linking environmental considerations to project funding. For example, the

**OAS** has supported numerous studies in A/B related to comprehensive land use planning (see CEP, 1991:135-138), the revitalization of St. John's, improving the infrastructure, and tourism development. Yet few of the recommendations of the various reports have been ever systematically considered let alone implemented. The DCA has yet to produce a National Development Plan, although there is some indication that Town and Country Planner, Angela Braithwaite, is working towards such a goal. Achieving Cabinet approval and implementation will still be required.

**CIDA** has been much more selective in the projects it has chosen to support in A/B, focussing primarily on reforestation projects (through **CARDI**) and sponsoring the Nelson's Dockyard National Park Development Plan. The **EEC** has also been fairly careful in its selection of Antiguan projects. Under **LOME 3**, it funded a Road Improvement Study and paid for the services of Statistical Advisor, Anthony Rooke, primarily to help with the 1991 census. While these and all the other initiatives of regional organizations, NGOs and international agencies have been supportive of A/B's environmental efforts, the record of performance suggests a relatively minor local impact partly because of their limited local visibility, leverage, and project scale.

### Stakeholder Self-Management Groups

There are a few small community based organizations in Antigua, and while they may rally to protest the location of a new solid waste site (**Fitches Creek Community Organization**) or a desal plant, they are very minor players. There are no **Community Land Trusts** actively buying up land to remove it in perpetuity from the speculative market. There are no **Castle Bruces** (Dominica) or **Nature Conservancy** holdings as in other islands. Although what is available in A/B is evidence of latent environmental energy, as the work of **EAG** especially documents, local efforts tend to be narrow, single-issue activities (Coconut Hall, McKinnon's, Jolly Hill, Christian Hill, etc.) and not sustained national strategies effectively channeled politically.

## **FIVE: CASE STUDIES OF NGO AND COMMUNITY RESISTANCE**

This section assesses the impact of NGOs and small community stakeholder/self-management groups on environmentally detrimental tourist development initiatives. It reviews five case histories: the Jolly Harbour Project, the Marina Bay Project, and the Coconut Hall Project on Antigua, and sand mining and the "K" Club on Barbuda. These cases clearly illustrate how NGO effectiveness in promoting coastal resource stability can be thwarted by a pro-growth tourism policy aggressively promoted by a powerful government and ecologically insensitive private developers.

### Jolly Harbour

In 1988, the German owner of the 500-room Jolly Beach Hotel (now Club Antigua) began work on the Jolly Harbour project, a marina/condominium project that was initially slated to add 1,500-2,000 rooms to the Antigua tourist plant. It has since been cut back because of slow sales and financial difficulties. Actual construction was undertaken by Devcon International of Florida and its local subsidiary, Antigua Masonry Products, a company in which Prime Minister Lester Bird has had a financial interest. Cabinet approved the sale of 53 acres of land for the project, most of it salt pond and mangrove swamp, for a very nominal sum of money. Later the GOAB made some other land available to the project.

The project began (1989) with the bulldozing of all the mangroves and all the shoreline vegetation (coconut trees, sea grapes etc.) on Mosquito cove, dredging the salt pond, and cutting a channel into Mosquito Cove. The dredge material was used to fill in certain areas of the salt pond/mangrove swamp. In essence the project destroyed the Jolly Hill salt pond/mangrove swamp, parts of adjacent Yorks salt pond, and it has virtually destroyed Mosquito Cove. The environmental impacts of the bulldozing, dredging and filling operations are noted in de Albuquerque (1991).

In August 1988, 408 members of the community of Bolans, which adjoins Jolly Hill and Jolly Beach, signed a petition protesting the sale of the 53 acres of Jolly Hill salt pond to the then German owner of Jolly Beach Hotel. The petition was presented by a delegation of residents to Prime Minister V.C. Bird, and demanded the cessation of "wanton distribution" of "prime and strategic lands" to "foreign adventurers". GOAB defended its action by calling the salt pond/mangrove swamp "useless land" and emphasized the beneficial economic impact of the project. Many residents of Bolans protested the lack of consultation and pointed out that the 500-room Jolly Beach Hotel had not had much of a positive economic impact on their community (see de Albuquerque, 1991). Some members of HAS, The Outlet newspaper, and many Antiguan complained loudly about the wanton destruction of beaches and salt ponds/mangroves. Articles appeared in the print media on the value of mangrove swamps. However, when ground breaking for the project commenced in 1989, the furor had subsided.

Currently the marina has been completed, a commercial center built, and several phases of condominiums have been constructed and are currently being marketed, primarily to overseas visitors. With the exception of providing some low wage jobs to people in Bolans and nearby Jennings, the self-contained project will have relatively small positive economic impact on these two communities.

### The Marina Bay Project

Planning for this project, a joint venture between the St. John's Development Corporation and Italian investors, began in 1986. Originally the project was planned for 1842 rooms and

together with a marina was to have encompassed 350 acres. It was scaled down because of legal (Government's claim to ownership of some of the land is in dispute) and financial problems. Final plans called for the completion of 125 luxury condominiums, a restaurant, marina and shopping complex. To date, only the first phase of the condominium project (28 units) has been completed and sales have been slow. The marina is not fully operational.

To build the project, the northern end of McKinnon's salt pond/mangrove swamp had to be dredged and filled, and a channel had to be cut between the salt pond and the northern end of Runaway Bay. This channel effectively cut off shoreline access between Runaway Bay and Dickenson Bay. The project also blocked off public access to Corbinson Point, a historic site (see de Albuquerque, 1991). The public outcry over the project was even more vocal than the outcry over Jolly Hill and handbills and posters appeared demanding "Save McKinnon's Swamp". Because the project was to affect two of the most popular beaches in Antigua, Runaway and Dickenson Bay, GOAB bowed to pressure and in 1987 commissioned an EIA. The EIA report noted some major problems with the project including the possible outflow of large amounts of fresh water "bearing suspended sediments and other pollutants" (Jackson et. al., 1987). It concluded that the short-term economic benefits of the project should be weighed against the long-term adverse effects on Runaway and Dickenson Bays and recommended a series of strategies to mitigate the environmental impacts. Like many such exercises, the EIA was immediately shelved, and none of the recommendations was implemented.

In June 1989, hundreds of thousands of dead fish appeared along a three mile area on the western side of McKinnon's pond. This ecological tragedy, occurring as it did a few days before Fisherman's Week, received considerable coverage in the media. Several qualified observers, including a fisheries officer, linked the massive fish kill to the Marina Bay development, which had impeded periodic natural flushing of the pond, and to raw sewage being pumped into the pond from nearby hotels. The fish kill became a very concrete example for the recently formed **EAG** to illustrate to Antiguans how GOAB's development policies were effecting the environment. At least two Senators were pushed to making statements in support of the environment, and several Government officials toured the area, but nothing concrete resulted. Another fish kill occurred at McKinnon's in July of 1990. It was attributed to similar causes: partially treated hotel sewage, high summer temperatures, and oxygen deprivation (CEP, 1991:6).

### Coconut Hall

In St. Peters parish (Antigua) overlooking Guiana Bay and Crump Island stands Coconut Hall, formerly the site of an old plantation. The shoreline is rich and diverse and the area is

still undeveloped. In 1992 over 80 acres of hillside and mangroves were bulldozed to make way for a major tourism project involving a hotel, condominiums, a golf course, marina, and shopping mall. The project developers, with Cabinet approval, submitted only a two-page plan to the **DCA**. The bulldozers started operating soon after receipt of preliminary approval for the excavation/land clearance work from **DCA**.

Few people in Antigua, and especially in the nearby communities of Seatons and Pares Village, had any advanced warning of the project. News of the destruction of the mangroves and the hillsides spread rapidly. The **EAG** rallied support throughout Antigua and people came out in droves to see the damage, and some even to stop the bulldozers, but they were deterred by the police who had somehow got wind of the impending action. The stand-off at Coconut Hall between developers and environmentalists was publicized widely in the local media, and was even covered in the regional and international press.

Like many other major projects in A/B, decisions regarding the proposed Coconut Hall development were made in secret and at Cabinet level. The appropriate agencies such as the **DCA**, the **Port Authority**, the **CBH**, the **HCEC** were by-passed or their recommendations ignored. When **EAG** members and other concerned Antiguan pointed out that the developers were in clear violation of a number of statutes, Tyrone Peters, then Acting Town and Country Planner at the **DCA**, issued a stop work order. Mr. Peters, an extremely competent professional, had complained in private for many years that his hands were tied and that the **DCA** had been rendered ineffective since all important development decisions were made by Cabinet and the various agencies were simply instructed to cooperate fully with developers.

Caught off guard by the extent of opposition to the Coconut Hall project, the Government promised that it would commission an Environmental and Social Impact Assessment and retained Ivor Jackson and Associates to conduct the study. As of this writing, no work on the Assessment has yet been done. After the furor over Coconut Hall died down, Mr. Peters was quietly fired by his superiors in the Ministry of Agriculture, Fisheries, Lands and Housing. He has since been replaced by another well-trained, perhaps more compliant, planner.

### Sand Mining in Barbuda

During the past two decades, tourist development and residential construction in the Caribbean has spawned a sustained demand for domestic and imported building aggregate. In the OECS countries, between 1982-1990, sand use in construction increased an average of 10 percent per year. Although sand sources include off-shore dredging, dry riverbed mining and crushed pumice, the sand of choice is beach/dune sand. According to Cambers (1994:2), "Most

imported sand comes from the dunes of Barbuda, which pays the long-term price of coastal degradation."

In 1975/76 sand mining operations began at Palmetto Point, a unique ecological area in the South West of Barbuda, noted for its sand dunes and Palmetto forests. Originally the GOAB entered into an agreement with Red Jacket Mines, an American company, to mine sand from the dunes at Palmetto Point. Since then ownership of the company has changed hands several times and currently the contract to mine sand in Barbuda is held by SandCo, a company whose main principal is Prime Minister Lester Bird. Two other Ministers, Robin Yearwood and Hugh Marshall, are also affiliated with Sandco. For nearly 18 years barges loaded with sand have left Barbuda, almost daily, for Antigua, the Virgin Islands, Martinique, Guadeloupe, St. Maarten and elsewhere in the region. Barbudan sand has supported the tourism related construction boom that has/is occurring on these islands. Coram (1993) reports that the GOAB receives a royalty of US \$.79 for every cubic yard of sand, which is then sold in Antigua for US\$ 5.55 (actually the current price of sand is much higher).

Under the original agreement the Barbuda Council was to have received royalties from the sand mining operation but was unable to collect any monies from Government forcing it to eventually file suit against SandCo and the GOAB. Although the Council has had several decisions go against it, a High Court Judge in Antigua issued a temporary injunction against further sand mining in 1992 because it was determined that sand mining had contaminated the islands groundwater supply. In 1993, the Court sentenced Agriculture Minister Hilroy Humphries and SandCO officials Knackbill Nedd and Reuben Wolf to a month in prison for continuing the sand mining operation in defiance of the Court Order. However, they were pardoned by the Governor General on a petition from Government.

At the height of the sand mining operation it was estimated that at least 20,000 tons of sand were being mined a month. The resultant hole that has been created by this operation is very large and over 7 meters deep. The water table is now just a few feet below the surface and the water no longer meets acceptable potable standards. There is also some indication that Barbuda's major freshwater aquifers are being contaminated by salt water intrusion as a result of the sand mining (the subject of the Court decision). An **EAG** team visiting Palmetto Point reported that when it rains a shallow lake several acres in size is created, thus increasing the chance of salt water intrusion. The team decried the systematic destruction of the dunes and the wholesale clearance of the Palmetto forests, and associated stands of Sea Grapes and Mangroves. Clearance of the dunes and forests has also had a very adverse impact on wildlife in the area. The sand mining operation has also caused considerable beach erosion in the area around the Point. At the abandoned Dulcina Hotel, several cottages have been

seriously undermined by the sea and are on the verge of collapsing. The CEP (1991) noted that the removal of sand in large quantities would "ultimately cause the collapse of the undersea topography in other areas." Destruction of the dunes also exposes the island and Codrington village to the full wrath of a hurricane. While the dunes are currently silent there is no telling when the sand mining operation will start up again. Even the Barbuda Council, which long complained about the greed of the Bird regime and the adverse environmental effects of sand mining, is considering starting a mining operation of its own. In the hiatus, local observers suggest that there has been an increase in illegal mining particularly on beaches in Antigua.

### The "K" Club

In 1988 Italian industrialist, Aldo Pinto, who is married to fashion designer, Mariucca Mandelli of "Krizia" fame, obtained a lease from Cabinet to nearly 200 acres of land in Barbuda near Spanish Wells Point. This was the same land that the GOAB had previously leased to a French Canadian called Cloutier. Using some of the same Italian workers who had built Heritage Quay and the Royal Antiguan, Pinto commenced construction of a luxury resort with golf course. The resort was to consist of an 80 room hotel with a second phase devoted to building villas to be sold to rich Europeans. To be able to build the golf course, the Italian contractors had to drain and fill a salt pond and clear a large stretch of mangroves. They also erected a fence around part of the property thereby blocking off the old coast road.

All of this was done without the approval of the Barbuda Council, and when the Council determined that the Italians had fenced off more land than they had been granted in the lease, they had the fence torn down. The Italians took Council to Court and won. Council had to put the fence back up and the road had to be moved east away from the coast. Impressed by the US\$1,000 day resort lavishly decorated by Mandelli (only a few units have been completed), Cabinet has leased a further 250 acres near Palmetto Point to Pinto and a group of other Italian investors. If stories of all the leases of Barbudan land by Cabinet are correct, all without the approval of the Barbuda Council, the island is poised for a major tourism development boom, which in no way can be supported by the current labor force in Barbuda. Meanwhile the golf course is seriously depleting Barbuda's freshwater supply. Putting a golf course on a dry island like Barbuda is irresponsible and a testament to the Government's insensitivity to the wishes of Barbudans. This disregard was also evident when Government, in collaboration with an American speculator named Strickland, attempted to use Barbuda as a way station to quarantine llamas.

### Lessons

These five case studies emphasize the depth of A/B's coastal

problems. First, they illustrate GOAB's persistent preference for short-run economic benefits over long-run environmental and sustainability concerns. They also emphasize (1) the aggressive nature of GOAB's pro-tourist policy, and (2) GOAB's support for relatively large-scale "transformational" developments that tend to cause irreversible alterations along the delicate coastal regions of the twin-island state.

Second, the cases demonstrate the thin top-down structure of A/B decision-making. Because of the habitual practice of Cabinet either overriding or ignoring the input of those agencies charged with conservation and mitigation, especially in the consideration of large-scale developments, it is clear that long-run environmental concerns have had negligible influence on economic policy up to the present. Without any operative internal controls, the current decision-making process suggests coastline regions will continue to deteriorate.

Thirdly, both Antigua and Barbudan cases illustrate the pervasive power of the Antigua-based GOAB apparatus. They show that appropriate environmental legislation without enforcement--a long-standing historical pattern in the islands--and popular awareness without decision-making or statutory autonomy are no match for a government dedicated to economic over environmental priorities and short-term personal enrichment and political survival.

Finally, except for occasional judicial intervention, the Antigua-Barbuda cases all illustrate the inability of NGOs and other environmental forces without statutory authority to meaningfully reverse current policy. Such groups simply have not achieved the requisite threshold of environmental consciousness inside the political directorate to mandate change. To be effective in the future, NGOs and other environmental interests must on the one hand extend even greater efforts to mobilize the media and the citizenry. On the other hand, new national environmental directions must be sought (land trusts, debt-equity swaps) and more innovative ways must be found to directly influence the Prime Minister and Cabinet concerning the continuing loss of the islands' natural, cultural and economic patrimony for future generations.

## SIX: IMPLICATIONS

This Report has emphasized the abundance of A/B's coastal resources: the variety of reefs and off-shore islands, shorelines unusually indented with bays, innumerable beaches, mangroves and salt ponds rich in biodiversity, historical monuments, and prehistorical settlement sites. It has also documented the continuing degradation of these resources through beach sand removal and dredging, shoreline devegetation, mangrove and salt pond destruction, and marine pollution through inadequate waste

treatment and disposal, and so on.

This result is not surprising given the current forces that shape the economic and institutional context. These include: (1) an unbalanced economy especially weak in those sectors (agriculture and fishing) with a stake in renewable resource uses; (2) an aggressive top-down tourism policy implemented without conservation safeguards; (3) a maturing visitor industry on the critical threshold of a high-density, mass-tourist, slow-growth path increasingly intrusive on the natural ecology and the residential way of life (crowding); (4) a debt burden limiting funding for restoration, mitigation, and monitoring; (5) a history of untrammelled, haphazard development in a permissive anti-regulatory regime; and (6) an entrenched oligarchical regime whose corrupt ways have been widely publicized in the region and internationally.

Indeed, specific policies could be suggested to improve A/B's coastal zone management. For example, Bunce, the principal investigator, in a coral reef monitoring project in Antigua sponsored by **IRF**, has suggested that the establishment of marine parks in Antigua could be supported by user fees from divers. Divers surveyed indicated that the establishment of marine parks would positively effect their decision to visit Antigua and they were willing to pay a user fee of as much as US\$6 a day (Bunce estimates that dive tourists spend about US\$251 a day in Antigua). Clearly there is no question about the economic value of reefs to Antigua's tourism economy or its inshore fishing industry. However, the problem becomes one of convincing the political directorate to create marine parks, prohibit spear fishing and fish traps in these parks, require boats to anchor only at fixed moorings installed by the **Fisheries Department**, enforce regulations that prevent dynamiting (for fish) and coral harvesting, etc. etc.

However, given Government's past record and the urgency for policy reversal, a more comprehensive long-term approach is warranted. It would involve simultaneously phasing in four major planning tasks that may require several years for completion. They include: (I) establishing the planning framework, (II) securing the necessary funding, (III) expanding environmental education and training, and (IV) creating mechanisms for participatory planning, information dissemination and decision-sharing by the public. The overall purpose of the program would be to achieve over time a critical mass of environmental understanding and commitment inside and outside Government such that elected official would become as accountable to the public for careful coastal conservation in the future as they have been for tourist development in the past.

The most important component of the entire process is **Task I**--securing approval of a **Comprehensive Land-Use Plan** that pays special attention to zoning set-asides in coastal areas for tourist, fisheries, and other water-dependent activities and that identifies protected areas rich in natural, cultural, and

historical assets. The Plan's implementation should provide impetus for activating Antigua's **National Park Plan** and for establishing an integrated **Master Plan for Tourist Development** that would focus on long-term sustainable goals: strengthening domestic linkages, improving the natural/cultural amenity base, controlling visitor densities and facility scale/siting, and ensuring broader local participation through training and other incentives.

To break with the lack of enforcement in the past, Government activities/responsibilities for coastal zone management would be vested in a new coordinating agency, say a **Coastal Conservation Agency (CCA)**, with Cabinet-level authority and requisite resources. Its major function would be to ensure that various government agencies do what they are supposed to do--provide effective stewardship and monitoring of coastal resources, parks, and protected areas, and enforce related laws and regulations. In addition, it would be charged with integrating long-term coastal resource uses with the **Comprehensive Land-Use Plan** and the **Master Plan for Tourist Development**. The CCA would also have specific oversight/review responsibilities for resort/marina developments in the coastal zone. Through required impact statements and ongoing monitoring through the respective government agencies, CCA would ensure that plan-established criteria be observed: set-backs, height requirements, beach access, native shoreline vegetation, mandatory sewage treatment, and so on.

To finance the design and implementation of the **Land-Use** and **Tourism Plans**, the operation of the CCA, and the strengthening of coastal resource activities of the various GOAB agencies, **Task II** would involve securing funds from a variety of sources. These include specific budget allocations from GOAB, grants and concessional loans from development institutions, regional and multilateral banks, and other donors. In addition, a concerted effort would be required to raise revenue from user fees, license fees, various visitor concessions, donations and the like. These funding initiatives would be given high priority early on because of their crucial connection with the start-up and completion of the planning framework (**Task I**).

**Task III** involves a concerted island-wide effort on coastal environmental education under the rubric of sustainability, i.e. to preserve a lasting natural and cultural patrimony, a viable tourism, and enduring recreational benefits for residents. The focus would involve teacher training, solidifying environmental curricula across all three school levels, and a public awareness campaign. These programs would take direction from the **EAG, HAS, AHTA, CAIC** and other local NGOs with support from the CCA, GOAB agencies actively engaged in coastal management, and regional and other organizations experienced in environmental educational outreach. The two-fold purpose of **Task III** would be to inform the community of A/B's unique natural/cultural assets embodied in the coastal zone, and to sensitize citizens to their fragility in a

tourist (marine) dependent island economy.

**Task IV** involves institutionalizing public participation such that the community's awareness and stake in its heritage can be accurately reflected in coastal zone management. This decision-making decentralization requires creating a variety of channels for information flows among developers, responsible government agencies and affected constituencies: NGOs, stakeholder self-management groups, sectoral interests and so on. Approval for major new projects/activities in coastal areas would require that the preferences of such groups be effectively expressed through such channels.

Although this four-task planning and community mobilization process is difficult to establish, and necessarily cumbersome, time-consuming and awkward in its early stages, without such a broad-based effort there is negligible hope for change. The legacy of past policy failure and environmental neglect coupled with an increasingly dynamic and intrusive high-density tourism style guarantee continuing destruction of coastal natural and historical assets as well as the long-term decline of Antigua's tourist competitiveness and viability. Bermuda's recent model of participatory planning growth controls, and coastal conservation demonstrate that policy reversal is possible in a small, highly tourist-dependent economy (de Albuquerque and McElroy, 1995). Antigua-Barbuda has many of the necessary ingredients to duplicate that effort. What is lacking is serious commitment to coastal preservation by the political directorate.

**Table 1**  
**Distribution of Real Gross Domestic Product at**  
**Factor Cost by Economic Activity, Antigua-Barbuda**

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Agri- culture	9.2	10.7	7.6	7.2	6.1	5.7	5.3	4.0	3.7	3.6	3.7	3.6	3.6	3.6	3.6	3.7	3.7
Mining/ Quarry- ing	0.1	0.03	0.05	0.1	0.1	0.04	0.05	0.07	0.1	2.0	2.5	2.5	2.5	2.3	2.3	2.1	2.0
Manu- fac- turing	4.3	5.1	5.3	5.9	6.8	6.8	6.5	6.3	5.9	5.7	5.4	5.1	4.9	4.9	4.5	4.1	3.9
Con- struc- tion	6.8	6.4	7.6	8.9	9.3	5.7	4.9	5.5	6.6	8.1	10.1	10.7	11.4	9.9	10.3	9.6	8.9
Elec./ Water	3.6	3.5	3.1	3.1	3.4	3.6	3.7	3.4	3.5	3.9	3.3	3.2	3.2	3.1	3.2	3.3	3.3
Tran- sport	12.0	12.2	13.4	12.6	12.0	12.1	12.7	12.9	13.1	13.4	13.4	14.2	14.1	14.1	13.6	13.4	14.0
Com- muni- cation	3.8	4.8	6.8	5.7	6.6	9.1	9.6	9.4	9.6	9.4	9.2	9.3	10.3	10.5	12.2	12.9	12.9
Whole- sale/ Retail	10.7	11.0	10.8	10.6	10.1	10.5	10.0	9.9	9.6	9.3	9.0	9.0	8.8	8.8	8.6	8.5	8.5
Hotel/ Rest- aurant	11.6	12.7	13.3	13.4	12.7	12.7	14.1	16.6	16.7	16.3	16.1	16.5	15.6	15.8	15.1	15.7	14.2
Banks/ Insur- ance	6.4	6.8	6.7	7.2	7.3	6.6	6.7	6.5	6.3	6.3	6.3	6.4	6.5	7.0	7.2	6.8	6.9

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993 <sup>1</sup>
Real Estate/Housing	12.0	11.9	11.0	10.7	10.5	11.0	10.6	10.0	9.6	9.1	8.8	8.5	8.3	8.4	8.3	8.4	8.4
Other Services	6.0	3.2	3.2	2.4	3.1	4.1	4.0	4.0	4.4	2.5	2.3	1.5	1.6	2.4	2.2	2.5	4.5
Government	13.5	11.7	11.2	12.2	12.0	12.1	11.9	11.4	10.9	10.4	9.9	9.5	9.2	9.2	8.9	9.0	8.8
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Computed from "Selected Economic Indicators: Antigua and Barbuda," Economic Affairs Secretariat, OECS, Antigua Statistical Office, St. John's, Antigua.

Notes: 1. 1993 Data Provisional.

**Table 2**  
**Selected Economic Indicators Antigua - Barbuda**

Year	Total Visitors <sup>1</sup> (000s)	Recurrent Budget Account (EC\$M)	Visible Trade Deficit (EC\$M)	Total External Debt Disbursed (US\$M)	Elect. Generated (MKwh)	Annual Growth real GDP (%)	Implicit GDP Deflator (%)
1977	104.1	-12.7	-75.2	18.1	44.6	-	-
1978	131.8	-8.4	-76.9	21.2	46.0	3.5	7.8
1979	169.9	-1.7	-69.8	31.0	44.9	10.2	10.9
1980	205.0	-3.6	-165.3	33.6	50.3	6.7	10.8
1981	209.0	-10.0	-191.8	46.9	53.9	5.0	7.2
1982	164.1	0.5	-317.6	51.6	55.2	0.4	9.2
1983	165.0	0.1	-240.8	53.0	65.5	6.7	5.1
1984	207.9	-1.2	-308.6	53.3	68.9	7.5	5.4
1985	273.3	-3.0	-404.0	55.5	76.5	8.8	6.7
1986	286.8	11.3	-507.4	151.8	86.4	9.7	7.5
1987	326.6	-1.2	-614.4	231.8	90.6	9.0	7.6
1988	376.7	-10.8	-615.4	243.4	103.4	7.7	10.6
1989	383.4	-8.2	-476.6	260.3	107.6	6.3	3.8
1990	412.1	-5.7	-631.5	263.1	111.6	3.5	2.5
1991	436.6	-6.2	-656.8	260.0	125.2	4.3	3.5
1992	443.7	1.1	-716.4	251.4	132.7	1.2	2.0
1993 <sup>2</sup>	460.2	NA	NA	NA	NA	3.4	3.0

Source: See Table 1 and ECCB, Report and Statement of Accounts (3/1993).

Notes: 1. Includes stayover and cruise, but not yacht visitors.  
2. Provisional estimates.

TABLE 3

## Population Size and Distribution by Parish and Island, 1960, 1970 and 1991

Parish	YEAR						% Change 1960-1991
	1960 <sup>1</sup>		1970 <sup>2</sup>		1991 <sup>3</sup>		
	N	% of Total	N	% Total	N	% Total	
St. John's	<u>28,953</u>	<u>53.3</u>	<u>35,669</u>	<u>55.0</u>	<u>35,635</u>	<u>60.0</u>	23.1
City <sup>4</sup>	21,595	39.8	21,814	33.7	21,514	36.2	----
Rural	<u>7,358</u>	<u>13.5</u>	<u>13,855</u>	<u>21.4</u>	<u>14,121</u>	<u>23.8</u>	----
St. George's	3,644	6.7	4,495	6.9	4,473	7.6	22.7
St. Peter's	3,192	5.9	4,479	6.9	3,622	6.1	13.5
St. Phillip's	4,127	7.6	5,141	7.9	2,964	5.0	28.2
St. Paul's	6,447	11.9	7,103	11.0	6,117	10.3	5.1
St. Mary's	6,798	12.5	6,836	10.6	5,303	8.9	22.0
Antigua (Total)	53,161	97.9	63,723	98.3	58,114	97.9	9.3
Barbuda	1,143	2.1	1,071	1.7	1,241	2.1	8.6
TOTAL	54,304	100.0	64,794	100.0	59,355	100.0	9.3

Source: Population Censuses, 1960, 1970, 1991

- Notes:
1. De facto population
  2. Results based on a sample of returns
  3. Generated resident population
  4. In 1976 St. John's City boundaries were changed from 0.85 sq. miles to 2.9 sq. miles. St. John's City and Rural data are not comparable between 1960 and 1991.

TABLE 4

## Population Density and the Number of Households by Parish and Island, 1960 and 1991

Parish	Population Density <sup>1</sup>			No. of Households <sup>2</sup>		
	1960	1991	% Change	1960	1991	% Change
St. John's	1,016	1,250	23.0	7,351	11,254	53.1
City <sup>3</sup>	25,406	7,419	---	5,590	6,963	---
Rural <sup>3</sup>	266	522	---	1,761	4,291	---
St. George's	394	484	22.8	890	1,419	59.4
St. Peter's	250	284	13.6	840	1,065	26.8
St. Phillip's	243	174	-28.4	964	886	-8.1
St. Paul's	348	331	-4.9	1,480	1,835	24.0
St. Mary's	298	241	-19.1	1,400	1,595	13.9
Antigua	492	538	9.3	12,925	18,054	39.7
Barbuda	18	20	11.1	240	367	52.9
Antigua and Barbuda	319	349	9.4	13,165	18,421	39.9

Sources: Population Census 1960 and 1991

- Notes:
1. Per square mile
  2. Private households
  3. St. John's City boundaries changed between 1960 and 1991 so the figures for St. John's City and St. John's Rural for the two census years are not comparable.

**TABLE 5****Selected Demographic Indicators, 1960-1991**

INDICATOR	Year		
	1960	1970	1991
Sex Ratio	87.3	89.4	93.1
Crude Birth Rate	34.6	23.8	21.2
Crude Death Rate	9.9	6.3	7.1
Rate of Natural Increase (%)	2.5	1.8	1.4
Total Fertility Rate (TFR)	NC	3.3	2.5
Median Age (Both Sexes)	NC	17.7	25.6
Males		16.5	24.5
Females		18.9	26.4
Life Expectancy (Years--both sexes)	62	62	72
Infant Mortality Rate	64	25	22

Sources: Population Censuses, 1970 and 1991  
GOAB, Department of Statistics  
U. S. Department of Commerce, 1978  
Population Reference Bureau, 1991  
Sinha, 1988

Note: NC - not computed

**TABLE 6**

**Estimated Net Migration, 1960-1991**

	<u>Population</u>	<u>1960-1990</u>		
		<u>Births</u>	<u>Deaths</u>	<u>Natural Increases</u>
1960	54,304			
1991	<u>59,355</u>	44,994	13,725	31,269
Net Change	5,051			

Estimated Net Migration = Net Change - Natural Increase

$$= 5,051 - 31,269 = -26,218$$

1960-1990 - Emigration to the U. S. (includes USVI)	20,329
Emigration to Canada	2,457
Emigration to U. K. and elsewhere	N/A

Source: Population Census, 1991 Preliminary Report and Summary Report

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**TABLE 7**  
**Place of Birth and Sex Ratios for the Foreign Born Population, 1991**

Place of Birth	No.	Percent	Sex Ratio
Dominica	2,580	20.9	66.9
Guyana	1,753	14.2	91.0
USA	1,382	11.2	105.0
Montserrat	892	7.2	94.8
United Kingdom	658	5.3	110.9
Dominican Republic	656	5.3	85.3
St. Vincent and Grenadines	505	4.1	185.3
St. Kitts/Nevis	495	4.0	80.7
USVI	451	3.7	110.7
St. Lucia	414	3.4	89.9
Jamaica	408	3.3	48.9
Other Countries	<u>2,140</u>	<u>17.4</u>	<u>84.1</u>
Total	12,334	100.0	91.7

Source: Population Census, 1991

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**TABLE 8**  
**Population by Broad Age Groups and Sex Ratio, 1970-1991**

<u>Age Group</u>	<u>1970</u>			<u>1991</u>		
	<u>No.</u>	<u>Percent</u>	<u>Sex Ratio</u>	<u>No.</u>	<u>Percent</u>	<u>Sex Ratio</u>
0-4	9,543	14.7	100.1	6,152	10.4	100.3
5-14	18,980	29.3	100.1	11,925	20.1	99.9
15-44	23,409	36.1	84.7	28,653	48.3	92.6
45-64	9,469	14.6	89.6	7,740	13.0	90.2
65+	3,270	5.1	47.5	4,885	8.2	76.7
Not Stated	123	.2		---	---	
ALL AGES	64,794	100.0	89.4	59,355	100.0	93.1

Source: Population Census, 1970 and 1991

**TABLE 9**  
**Qualitative Assessment of Antigua's Coastal Resources, Beaches and Bays**

<b>Beaches/Shorelines</b>	<b>Status</b>	<b>Observations</b>	<b>Reasons</b>
Hog John Bay (Yeptons)	S <sub>2</sub> D	extensive brush clearance, some erosion, beach/water related activities	tourism development (hotel)
Pillar Rock	S <sub>2</sub> D	extensive brush clearance, beach/water related activities	tourism development (condominiums)
Deep Bay	S <sub>2</sub> D	extensive brush clearance, slight erosion, extensive beach/water related activities, heavy siltation, marine pollution	tourism development (dredging and fill)
Galley Bay	S <sub>2</sub> D	extensive brush clearance, erosion, extensive beach/water related activities	tourism development (hotel)
Landing Bay	NP		
Hawksbill Bay	S <sub>2</sub> D	brush clearance, erosion, extensive beach/water related activities	tourism development (hotel)
Pinching Bay	NP		
New Division Bay	NP		
Hermitage Bay	S <sub>3</sub> D	brush clearance, severe beach erosion	sand mining
Pearns Bay	S <sub>3</sub> D	brush clearance, severe beach erosion	sand mining
The Cove (Pearns Pt.) (Leper Colony)	S <sub>3</sub> D	heavy siltation, erosion, destruction of corals and sea grass beds	dredging for Jolly Harbour development
Mosquito Cove	Lost	beach, mangroves and salt pond destroyed	tourism development (Jolly Harbour)
Lignum Vitae Bay (Jolly Beach)	S <sub>3</sub> D	extensive brush and tree clearance, extensive beach/water related activities, oil pollution through boating activities, turbidity, destruction of marine organisms, damage to coral and sea grass beds	tourism related activities (Jolly Beach Hotel)

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TABLE 9 (Cont'd)

Beaches/Shorelines	Status	Observations	Reasons
Ffryes Bay	S <sub>3</sub> D	severe beach erosion, brush and tree clearance, litter, solid waste dumping	sand mining extensive beach use (tourists and residents)
Darkwood	S <sub>3</sub> D	extensive tree and brush clearance, sediment runoff, damage to corals, and sea grass beds, extensive mangrove damage	land development, extensive beach use, sand mining
Crab Hill Bay (Johnson's Point)	S <sub>2</sub> D	extensive tree and brush clearance, some beach erosion, damage to corals and sea grass beds	tourism development (hotel, cottages), artisanal fishing
Morris Bay (Curtain Bluff)	S <sub>2</sub> D	extensive brush and tree clearance, some beach erosion	tourism development (hotels)
Carlisle Bay	S <sub>2</sub> D	extensive brush and mangrove clearance, sediment runoff, beach/water related activities	tourism development (hotel)
Farley Bay	S <sub>1</sub> D	Some litter	occasional beach use
Rendezvous Bay (Doigs Beach)	S <sub>1</sub> D	brush clearance, litter, some erosion	planned land development, occasional beach use
Pigeon Pt.	S <sub>2</sub> D	brush and tree clearance, some destruction of corals and sea grass beds	residential development, boat anchors, dinghies, extensive beach use, yacht anchorage
Freemans Bay (English Harbour)	S <sub>2</sub> D	extensive brush and tree clearance, sediment runoff, damage to sea grass beds, extensive beach and water activities, marine pollution (raw sewage, oil, diesel, etc.) turbidity	yacht anchorage, tourism development (hotels/restaurants), residential development
Mamora Bay	S <sub>2</sub> D	extensive brush and tree clearance, damage to coral and sea grass beds, extensive beach and water activities, turbidity	tourism development (hotel), residential development (Savannah)

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TABLE 9 (Cont'd)

Beaches/Shorelines	Status	Observations	Reasons
Willoughby Bay	S <sub>1</sub> D	brush and tree clearance some mangrove destruction	residential development proposed tourism development (initial dredging)
Half Moon Bay	S <sub>1</sub> D	extensive brush and tree clearance, some damage to corals and sea grass beds,  extensive beach and water activities, litter Some oil pollution from ships, some beach erosion (natural causes)	tourism development (hotel) extensive beach use (tourists and residents)
Exchange Bay	S <sub>2</sub> D	extensive brush and tree clearance, some damage to corals and sea grass beds, extensive beach and water activities	tourism development (hotel)
Great Deep Bay and Little Deep Bay	S <sub>1</sub> D	some brush and tree clearance	tourism development (villas)
Nonsuch Bay (Brown's Beach)	S <sub>1</sub> D	brush and tree clearance, sediment run off	residential development tourism development
Long Bay	S <sub>2</sub> D	extensive brush and tree clearance, litter, extensive beach and water activities, damage to coral and sea grass beds, destruction of mangroves	tourism development (hotels, restaurants)
Mercers Creek Bay	S <sub>1</sub> D	brush and tree clearance solid waste dumping, sediment run off, damage to sea grass beds	residential development artisanal fishing
Guiana Bay	S <sub>1</sub> D	brush and tree clearance, artisanal fishing	land development (proposed tourism development)
Crabs Peninsula	S <sub>2</sub> D	extensive brush and tree clearance, marine pollution (oil diesel), thermal pollution, damage to corals and sea grass beds, some mangrove destruction	marine activities, land development

TABLE 9 (Cont'd)

Beaches/Shorelines	Status	Observations	Reasons
Fitches Creek Bay	S <sub>1</sub> D	extensive brush and tree clearance, litter, solid waste dumping, damage to sea grass beds, beach and water activities, coastal erosion, some mangrove destruction	residential development, tourism development artisanal fishing
Winthorpes Bay	S <sub>1</sub> D	extensive brush and tree clearance, litter, solid waste dumping, damage to sea grass beds, beach and water activities	residential development tourism development artisanal fishing
Dutchman Bay	S <sub>2</sub> D	extensive brush and tree clearance beach and water activities coastal erosion	tourism development (hotels) U.S. Naval Facility
Hodges Bay (Jabberwock)	S <sub>2</sub> D	extensive brush and tree clearance, some damage to corals and sea grass beds, sediment run off, litter, solid waste dumping	residential development tourism development sand mining
Boons Bay	S <sub>2</sub> D	extensive brush and tree clearance, sediment run off, some damage to corals and sea grass beds	residential development tourism development
Blue Waters Bay	S <sub>2</sub> D	extensive brush and tree clearance, sediment run off, damage to corals and sea grass beds, extensive beach and water activities slight to moderate coastal erosion	residential development tourism development (hotel)
Langford Bay	S <sub>1</sub> D	brush and tree clearance, some sediment run off	residential development
Dickenson Bay	S <sub>3</sub> D	extensive brush and tree clearance, extensive beach and water activities, sewage discharge, marine pollution (oil, diesel, gasoline), extensive damage to corals and sea grass beds, turbidity slight to moderate beach erosion	tourism development (hotels and restaurants)

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TABLE 9 (Cont'd)

Beaches/Shorelines	Status	Observations	Reasons
Runaway Bay	S <sub>3</sub> D	extensive brush and tree clearance, extensive beach and water activities, sewage discharge, marine pollution (oil, diesel, gasoline), extensive damage to corals and sea grass beds, sediment run off, turbidity moderate beach erosion	tourism development (hotels, and restaurants), sand mining
Fort Bay (Fort James)	S <sub>3</sub> D	extensive brush and tree clearance extensive beach and water activities, litter, solid waste dumping of dredge spoil, sediment run off, moderate beach erosion	land development (bulldozing) recreational and tourism development (restaurants, beach bars) sand mining

Source: Personal Observations, Klaus de Albuquerque (1986-1994); Personal Communication, E. T. Henry, Leah Bunce, and Kevel Lindsay.

Note: P = Pristine -- no evidence of human impacts

NP = Near Pristine -- little evidence of human impacts (some litter, less than 2%, shoreline vegetation destroyed, little or no beach erosion as a result of human activity, little or no siltation of beach waters)

S<sub>1</sub>D = Slightly degraded --considerable evidence of human impacts (litter, 2-10% shoreline vegetation destroyed, some beach erosion partially as a result of human activity, some siltation of beach waters)

S<sub>2</sub>D = Significantly degraded -- very significant evidence of human impacts (moderate amount of litter, 10-50% of shoreline vegetation destroyed, moderate beach erosion partially as a result of human activity, moderate siltation of beach waters)

S<sub>3</sub>D = Severely degraded -- evidence of excessive human impacts (large amount of litter, greater than 50% shoreline vegetation destroyed, severe beach erosion partially as a result of human activity, heavy siltation of beach waters)

L = Lost

**TABLE 10**  
**Qualitative Assessment of Antigua's Coastal Resources, Salt Ponds/Mangrove areas**

<b>Salt Pond/Mangrove Area</b>	<b>Status</b>	<b>Observations</b>	<b>Reasons</b>
<b>Ballast Bay (St. John's)</b>	L	reclaimed land filled in by dredged materials	road to Deep Bay (Ramanda Renaissance Hotel)
<b>Deep Bay</b>	S <sub>2</sub> D	parts reclaimed, destruction of pollution	tourism development (hotels)
<b>Galley Bay</b>	S <sub>2</sub> D	some fill in, destruction of some mangroves	expansion of Galley Bay Hotel
<b>Pinching Bay</b>	S <sub>1</sub> D	some brush and tree clearance	road to beach
<b>The Flashes</b>			
-- Salt Pond	S <sub>2</sub> D	parts reclaimed	road to Deep Bay
-- Mangrove Areas	S <sub>2</sub> D	solid waste dumping, industrial	inadequate solid waste disposal system and toxic waste, clearing of mangroves
<b>Yorks</b>			
-- Salt Pond	S <sub>2</sub> D	extensive brush and tree clearance	grazing animals, solid waste dumping inadequate solid waste disposal system
-- Mangrove Areas	S <sub>2</sub> D	some clearing of mangroves	
<b>Jolly Hill</b>			
-- Salt Pond	L	lost to Jolly Harbour	tourism development (marina and condominiums)
-- Mangrove Areas	L	lost to Jolly Harbour	
<b>Cocks Hill</b>	S <sub>2</sub> D	extensive brush and tree clearance,	tourist related development some dumping, some fill in
<b>Valley Church</b>	S <sub>1</sub> D	extensive brush and tree clearance,	inadequate solid waste disposal system some solid waste dumping
<b>Dark Wood</b>			
-- Salt Pond	S <sub>3</sub> D	solid waste dumping, heavy siltation,	land development (bulldozing hillside) some fill in
-- Mangroves	S <sub>3</sub> D	extensive destruction	

TABLE 10 (cont'd)

Salt Pond/Mangrove Area	Status	Observations	Reasons
<b>Crab Hill</b>			
-- Salt Pond	S <sub>2</sub> D	some fill in, some dumping	tourism development (hotel, apartments)
-- Mangroves	S <sub>3</sub> D	extensive destruction	
<b>Carlisle Bay</b>			
-- Salt Pond	L	cleared and filled in	tourism development (hotel, tennis courts)
-- Mangroves	L	cleared and filled in	
<b>Falmouth</b>			
-- Mangrove Area	L	cleared	commercial, residential and tourism development
<b>Bethesda/Christian Cove</b>			
-- Salt Ponds	S <sub>1</sub> D	some solid waste dumping	inadequate solid waste disposal system
-- Mangrove Area	S <sub>1</sub> D	some clearing	land development
<b>Solider Point</b>			
-- Mangrove Area	NP		
<b>Ayres Creek</b>			
-- Mangrove Area	S <sub>2</sub> D	some siltation, considerable area	land development destroyed
<b>Ledeatt Cove (Emerald Cove)</b>			
-- Mangrove Area	L	cleared	tourism development (Emerald Cove Villas)

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TABLE 10 (cont'd)

Salt Pond/Mangrove Area	Status	Observations	Reasons
<b>Lord's Cove</b>			
-- Mangrove Area	NP		
<b>Kelly's Landing</b>			
-- Mangrove Area	S <sub>1</sub> D	some siltation from surface run off	land development
<b>Mercers Creek</b>	NP		
<b>Farley Bay</b>	NP		
<b>Crump Island</b>			
-- Mangrove Area	NP		
<b>Crumps Wharf (Coconut Hall)</b>	S <sub>3</sub> D	extensive clearing	land development (Coconut Hall)
<b>Hand Point/the Narrows/Guiana Island</b>			
-- Mangrove Area	S <sub>1</sub> D	some clearing	road, Ferry to Guiana Island
<b>Crabs Point</b>	S <sub>2</sub> D	marine pollution, some dumping,	Crabs Marina some clearing of mangroves
<b>Parham</b>			
-- Mangrove Areas	S <sub>2</sub> D	some solid waste dumping, some	inadequate solid waste disposal system clearing of mangroves
<b>Fitches Creek</b>			
-- Mangrove Areas	S <sub>1</sub> D	some solid waste dumping	land development some siltation from surface run off

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TABLE 10 (cont'd)

Salt Pond/Mangrove Area	Status	Observations	Reasons
<b>Mckinnon's</b>			
-- Salt Pond	S <sub>2</sub> D	sewage discharge, dredging channel	tourism development (Marina Bay) Runaway Bay, oil pollution from old refinery, very high BOD's
-- Mangrove Areas		considerable clearing and fill in,	tourism development, e.g. (Marina Bay, mangroves dying in some areas restaurant), land development (residential and commercial)

Source: Personal Observation, Klaus de Albuquerque, 1986-1994.  
 Personal Communication, E. T. Henry, Leah Bunce, and Kevel Lindsay.

Note: P = Pristine -- no evidence of human impacts

NP = Near Pristine -- little evidence of human impacts (some litter, less than 2%, shoreline vegetation destroyed, little or no beach erosion as a result of human activity, little or no siltation of beach waters)

S<sub>1</sub>D = Slightly degraded --considerable evidence of human impacts (litter, 2-10% shoreline vegetation destroyed, some beach erosion partially as a result of human activity, some siltation of beach waters)

S<sub>2</sub>D = Significantly degraded -- very significant evidence of human impacts (moderate amount of litter, 10-50% of shoreline vegetation destroyed, moderate beach erosion partially as a result of human activity, moderate siltation of beach waters)

S<sub>3</sub>D = Severely degraded -- evidence of excessive human impacts (large amount of litter, greater than 50% shoreline vegetation destroyed, severe beach erosion partially as a result of human activity, heavy siltation of beach waters)

L = Lost

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**TABLE 11**  
**Qualitative Assessment of Antigua's Coastal Resources, Harbours**

Harbour	Status	Observations	Reasons
St. John's	S <sub>3</sub> D	dredging, sewage discharge, solid waste dumping, dredge fill, marine pollution (oil, diesel, gasoline, toxic wastes), sediment run off, excessive turbidity, destruction of benthic communities considerable debris (bottles, cans, etc.)	land development, dredging infrastructure development, no sewage system, shipping activities (cruise, cargo, etc.)
Falmouth Harbour	S <sub>2</sub> D	sewage discharge (mostly yachts), solid waste dumping, some marine pollution (oil, diesel, gasoline), sediment run off, damage to corals and sea grass beds, destruction of mangroves	Anchored yachts, other marine activities tourism development (hotels and restaurants) residential development
English Harbour	S <sub>2</sub> D	Sewage discharge (mostly yachts), marine pollution (oil, diesel, gasoline) sediment run off, damage to corals, sea grass beds and mangroves, considerable debris (bottles, cans, etc.)	anchored yachts tourism development (hotels and restaurants), residential development
Parham Harbour	S <sub>2</sub> D	sewage discharge solid waste dumping marine pollution (oil, diesel, gasoline) damage to sea grass beds and mangroves	residential development marine activities artisanal /commercial fishing

Sources: Personal observations, Klaus de Albuquerque, 1986-1994.

Personal Communication, E. T. Henry, Leah Bunce, and Kevel Lindsay, Weiss, 1989.

Note: P = Pristine -- no evidence of human impacts

NP = Near Pristine -- little evidence of human impacts (some litter, less than 2%, shoreline vegetation destroyed, little or no beach erosion as a result of human activity, little or no siltation of beach waters)

S<sub>1</sub>D = Slightly degraded --considerable evidence of human impacts (litter, 2-10% shoreline vegetation destroyed, some beach erosion partially as a result of human activity, some siltation of beach waters)

S<sub>2</sub>D = Significantly degraded -- very significant evidence of human impacts (moderate amount of litter, 10-50% of shoreline vegetation destroyed, moderate beach erosion partially as a result of human activity, moderate siltation of beach waters)

S<sub>3</sub>D = Severely degraded -- evidence of excessive human impacts (large amount of litter, greater than 50% shoreline vegetation destroyed, severe beach erosion partially as a result of human activity, heavy siltation of beach waters)

L = Lost

**TABLE 12**  
**Qualitative Assessment of Antigua's Coastal Resources, Reefs**

<b>Reef Location</b>	<b>Reef Quality Index</b>	<b>Observations</b>	<b>Reasons</b>
Long Island	26	Low coral species richness and abundance, some dead coral and coral rubble, high algal abundance	Jumby Bay Resort, snorkelers, divers, anchored boats, fish traps
Little Bird Island	24-25	low coral species richness and abundance, high algal abundance and richness	fish traps, anchored boats, spear fishing
Great Bird Reef	28	low coral species richness and abundance high algal abundance and richness	fish traps, anchored boats, divers and snorkelers, possible contamination (marina, desal and cement plant)
Bird Island Channel	28-35	low coral species richness and abundance some dead coral and coral rubble, high algal abundance	fish traps, anchored boats, spear fishing
Boon Reef	N/A	low coral abundance, and moderate coral, species richness, high algae species, richness and abundance	fish traps, spear fishing, eutrophication (sewage discharge from hotels), anchored boats, divers
Sandy Island	28	high coral species richness and abundance, moderate algae species richness and abundance, lower visibility, low fish population density	anchored boats, divers, snorkelers, fish traps, spear fishing
Fort Barrington	17	low coral species richness and abundance high algae species richness and abundance, low fish population density, heavily sedimented	sewage discharge (hotels, St. John's) dredging in St. John's harbour
Middle Reef	16	low coral species richness and abundance moderate algal abundance, low fish population density	snorkelers, spear fishing
Ariadne Float	NA	high coral abundance, moderate coral species richness, low algae species richness and abundance, good visibility, high fish population density	off-shore reef
Cades Reef	29-34	moderate coral species richness and abundance moderate to high algae species richness and	fish traps, spear fishing, anchored boats, divers and snorkelers, hurricane effects

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TABLE 12 (cont'd)

Reef Location	Reef Quality Index	Observations	Reasons
Rendezvous Bay	25	low coral species richness and moderate coral abundance, low algae abundance	spear fishing, coral harvesting
Bishops reef	35	low coral species richness and moderate coral abundance, low algae abundance	somewhat isolated
Indian Creek	37	moderate coral species richness and abundance, low algae abundance, moderate fish population density	isolated
Mamora Reef	29	low coral species richness and moderate coral abundance, moderate algae abundance, low fish population density	snorkeling, boat anchors
Horseshoe Reef	27-30	low coral species diversity, moderate high algal species diversity and abundance, moderate fish population	somewhat isolated

Source: Personal Observation, Great Bird Island, Middle Reef, Cades Reef, Rendezvous Bay and Mamora Reef, 1986-94.  
 Bunce, 1994.  
 Deep Quadrant, 1989.  
 Weiss, 1989.

Note: Reef Quality Index - 50 represents a maximum score and indicates a reef in excellent condition, 10 represents a minimum score.

**TABLE 13**  
**Qualitative Assessment of Antigua's Coastal Resources, Off-Shore Islands**

Off-Shore Island	Status	Observations	Reasons	Comments
Green Island	NP	some litter some threat to wildlife	day trippers overnight campers fishermen, poachers	turtle nesting sites
Pelican Island	NP	some litter some threat to wildlife	day trippers fishermen, poachers	
Crump Island	NP	marine park		
Guiana Island	NP	some litter some threat to wildlife	day trippers fishermen	
Great Bird Island	NP	some litter some threat to wildlife	day trippers poachers	
Long Island	S <sub>1</sub> D	some brush clearance some threat to wildlife	tourism development (Jumby Bay)	turtle nesting sites
Sandy Island	S <sub>1</sub> D	litter, some destruction of corals	day trippers	turtle nesting sites

Source: Personal Observation, Klaus de Albuquerque, 1986-1994.  
 Personal Communication, E. T. Henry, Leah Bunce and Kevel Lindsay.

Note: P = Pristine -- no evidence of human impacts

NP = Near Pristine -- little evidence of human impacts (some litter, less than 2%, shoreline vegetation destroyed, little or no beach erosion as a result of human activity, little or no siltation of beach waters)

S<sub>1</sub>D = Slightly degraded --considerable evidence of human impacts (litter, 2-10% shoreline vegetation destroyed, some beach erosion partially as a result of human activity, some siltation of beach waters)

S<sub>2</sub>D = Significantly degraded -- very significant evidence of human impacts (moderate amount of litter, 10-50% of shoreline vegetation destroyed, moderate beach erosion partially as a result of human activity, moderate siltation of beach waters)

S<sub>3</sub>D = Severely degraded -- evidence of excessive human impacts (large amount of litter, greater than 50% shoreline vegetation destroyed, severe beach erosion partially as a result of human activity, heavy siltation of beach waters)

L = Lost

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**TABLE 14**  
**Qualitative Assessment of Barbuda's Coastal Resources**

<b>Resource</b>	<b>Status</b>	<b>Observations</b>	<b>Reasons</b>
<b><u>Beaches/Shoreline</u></b>			
<b>Billy Pt. to Cedar Tree Pt.</b>	NP		
<b>Cedar Tree Pt. to Low Bay</b>	NP		
<b>Low Bay</b>	NP	some litter	day trippers (tourists and residents)
<b>Palmetto Pt.</b>	S <sub>3</sub> D	destruction of sand dunes building of Palmetto forests, sea grape stands and mangrove stands, salt water intrusion, beach erosion	sand mining (halted under court order), tourism development (hotel and condominiums)
<b>Martello Tower</b>	S <sub>1</sub> D	brush clearance, some erosion litter	day trippers
<b>The Landing</b>	S <sub>3</sub> D	extensive brush clearance, severe beach erosion, unsightly	sand mining operation base, pier has interrupted normal current solid waste flow
<b>Dulcina</b>	S <sub>2</sub> D	extensive brush clearance, significant beach erosion	tourism development
<b>K-Club</b>		extensive brush and tree clearance, filling in of salt pond, bulldozing of mangrove stands, some beach erosion	tourism development
<b>Coca Pt.</b>		Extensive brush clearance, some erosion	tourism development
<b>Spanish Pt.</b>	NP	planned tourism development	(on hold)
<b>Pelican Bay</b>	P		
<b>Castle Bay</b>	NP	some litter	occasional day trippers
<b>Rubbish Bay</b>	P		
<b>Two Feet Bay</b>	NP	some litter	day trippers
<b>Goat Island</b>	P		
<b><u>Salt Ponds/Mangroves</u></b>			
<b>Codrington Jetty</b>	S <sub>1</sub> D	solid waste dumping, diesel and gasoline pollution	boating/shipping activities, inadequate waste disposal system
<b>Cuffy Creek (Mangroves)</b>	NP		

TABLE 14 (cont'd)

Resource	Status	Observations	Reasons
Goat Island Flasher (Mangroves)	P		
Goat Island Codrington Lagoon Side (Mangroves)	NP		
<b>South Codrington Lagoon</b>			
-- Mangroves	NP		
-- Salt Ponds	NP		
<b><u>K-Club</u></b>			
-- Salt Pond	S <sub>3</sub> D	partially filled in	tourism development
-- Mangroves	S <sub>3</sub> D	partially destroyed	
<b><u>Cocoa Pt.</u></b>			
-- Salt Ponds	S <sub>1</sub> D	solid waste dumping	inadequate solid waste disposal system
-- Mangroves	S <sub>1</sub> D		
<b><u>Reefs</u></b>		<b><u>Reef Quality Index</u></b>	
Spanish Pt.	NA	moderate coral species richness and abundance, low algal abundance	fishing, diving
Cocoa Pt.	NA	moderate coral species richness and abundance, low algal abundance	fishing, diving
Palaster	32	moderate coral species richness and abundance, low algal abundance	fishing, diving

Source: Personal Observation, Klaus de Albuquerque, 1987 and 1989,  
Personal Communication, E. T. Henry, Ivan Pereira, Kevel Lindsay.  
ECNAMP, 1980.  
CEP, 1991.

Note: P = Pristine -- no evidence of human impacts

NP = Near Pristine -- little evidence of human impacts (some litter, less than 2%, shoreline vegetation destroyed, little or no beach erosion as a result of human activity, little or no siltation of beach waters)

S<sub>1</sub>D = Slightly degraded -- considerable evidence of human impacts (litter, 2-10% shoreline vegetation destroyed, some beach erosion partially as a result of human activity, some siltation of beach waters)

S<sub>2</sub>D = Significantly degraded -- very significant evidence of human impacts (moderate amount of litter, 10-50% of shoreline vegetation destroyed, moderate beach erosion partially as a result of human activity, moderate siltation of beach waters)

S<sub>3</sub>D = Severely degraded -- evidence of excessive human impacts (large amount of litter, greater than 50% shoreline vegetation destroyed, severe beach erosion partially as a result of human activity, heavy siltation of beach waters)

L = Lost; NA = Not available

Reef Quality Index - 50 maximum (excellent condition), 10 minimum

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**TABLE 15**  
**Legislation That Has a Bearing on the Management of Coastal Resources**

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<b>Agriculture</b>	The Pesticides Control Act (No. 15 of 1973) Plant Protection Act (Cap. 102)
<b>Beaches</b>	Beach Control Ordinance (Cap. 297, 1959) Beach Control (Prevention of Danger) Regulations (SRO No. 25 of 1976) Beach Protection (Cap. 298, 1957) Beach Protection (Amendment) Act (No. 1)
<b>Development</b>	Land Development and Control Act (No. 15 of 1977) St. John's Development Corporation Act (No. 1 of 1986)
<b>Fisheries</b>	Turtle Ordinance (Cap. 333, 1927) Fisheries (Protection of Lobster) Regulations (Cap. 98, No. 3 of 1978) The Fisheries Act (No. 14 of 1983) Maritime Area Act (No. 25 of 1986) The Fisheries Regulations (1990)
<b>Forests</b>	Forestry Act (Cap. 299, 1941) Forest Regulations (SRO No. 13 of 1941) Forest Regulations (SRO No. 42 of 1952) Barbuda (Cutting of firewood) By-Law (SRO No. 23 of 1934) Bush Fires Act (Cap. 303)
<b>Planning</b>	Town and Country Planning Act (Cap. 278, 1948) Town and Country Planning Regulations (SRO, No. 24, 1953)
<b>Ports and Harbours</b>	The Port Authority Act (No. 9 of 1973)
<b>Protected Areas</b>	Botanical Gardens Act (Cap. 300, 1900) The Marine Areas (Preservation and Enhancement) Act (No. 5 of 1972) The Marine Areas (Preservation and Enhancement) Regulations (SRO No. 25, 1973) The Marine (Restricted Areas) Order (SRO No. 47, 1973) The National Parks Act (No. 11 of 1984) The National Parks (Amendment) Act (No. 3 of 1986)
<b>Water</b>	Water Courses and Water Works Regulations (SRO No. 23, 1954) Water Courses and Water Works Regulations (SRO No. 24, 1961) The Public Health Ordinance (Cap. 236, 1957)
<b>Waste Management</b>	Public Health Regulations (SRO No. 24, 1958) Public Health Regulations (SRO No. 25, 1958) Public Health Regulations (SRO No. 35, 1959) Dumping at Sea Act (No. 29 of 1975) The Litter Act (No. 7 of 1987) The Litter (Fixed Penalty Procedure) Regulations (SRO No. 41, 1984) The Litter (Fixed Penalty Procedure) (Amendment) Regulations (SRO No. 16, 1985)
<b>Wildlife</b>	Wild Birds Protection Ordinance (Cap. 115, 1919) Proclamation (SRO No. 16, 1937) Proclamation (SRO No. 3, 1976) The Barbuda (Shooting and Fishing) By-Law (SRO No. 44, 1983) Protection of Animals Act (Cap. 113)

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**TABLE 16**  
**SELECTED TOURISM INDICATORS, 1970 - 1993**

	1970	1980	1986	1987	1988	1989	1990	1991	1992	1993
<b>Total Visitor Arrivals<sup>1</sup></b>	63,369	N/A	294,051	333,293	406,389	406,640	444,714	463,040	468,822	486,769
<b>Stay-Over</b>		N/A	156,688	172,233	187,167	189,079	197,046	196,571	209,902	240,185
Air		86,571	149,322	159,207	176,893	175,500	184,248	182,188	193,589	221,230
Sea		N/A	9,366	14,026	10,274	13,579	12,798	14,383	16,313	18,955
<b>Cruise Ship</b>	18,705	107,094	122,613	153,542	199,810	207,969	227,329	254,417	250,187	238,473
(No. of Calls)	(71)	(164)	(239)	(268)	(274)	(349)	(325)	(421)	(346)	(319)
<b>Yachts</b>	N/A	N/A	14,750	20,544	29,686	23,171	33,137	26,435	25,046	27,066
Windjammer		3,100	4,394	7,480	9,804	8,611	8,678	10,973	8,640	9,141
Pvt. Yachts		N/A	10,356	13,064	19,822	14,540	24,459	15,462	16,406	17,925
<b>Total Visitor Expenditure</b> (US \$ Mill.)	11.8 <sup>3</sup>	42.0	131.1	147.7	172.9	173.5	199.0	205.9	221.6	244.0 <sup>3</sup>
Stay-overs		38.2	138.0	144.6	168.6	168.8	193.7	200.1	215.7	238.6
Cruise Passengers		3.8	3.1	3.1	4.3	4.7	5.3	5.8	5.9	5.4 <sup>3</sup>
<b>Visitor Expenditure as a % of GDP</b>	N/A			79.6	84.8	82.5	87.6			
<b>No. of Rooms</b>	1,036 <sup>3</sup>	1,879	2,419	2,752						
<b>No. of Beds</b>	2,093	3,746	4,838	5,822						
<b>Average Length of Stay (days)<sup>2</sup></b>	4.2	N/A	7.2	7.2	7.7	8.4	8.3	8.3	8.3	8.3

Sources: GOAB, Department of Tourism  
Kastarlak, 1974  
McVey, 1987  
CTO, Caribbean Tourism Statistical Reports

Notes: 1. Air Stay-overs + Cruise Passengers + Yacht Passengers  
2. Computed from air arrivals only  
3. Authors' estimate

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**TABLE 17**  
**TOURIST DENSITY RANKINGS FOR SELECTED CARIBBEAN ISLANDS, 1992**

Island	Stayovers (000s)	Average Stay (Days)	Cruise (000s)	Mid-Year Population (000s)	Average Daily Density per 1,000 pop. <sup>1</sup>
St. Maarten	569	4.8	470	32	274
British VI	136	8.8	79	17	206 <sup>2</sup>
Cayman Is.	242	4.7	614	29	165
Aruba	542	7.2	217	71	159
Bermuda	374	6.5	131	61	115
Bonaire	51	7.4	28	11	101
Turks/Caicos	52	8.4	--	13	92
Antigua	218	8.3	250	63 <sup>3</sup>	90
Anguilla	30	10.6	--	10	88
USVI	487	4.1	1,277	106	85
Montserrat	23	11.0	5	12	59
St. Kitts	88	8.9	74	42	56
Barbados	385	10.6	400	259	47
St. Lucia	178	10.7	179	138	41
Curacao	207	7.3	160	146	31
Grenada	88	6.5	196	91	23
Dominica	47	7.8	90	71	18
Guadeloupe	341	6.1	246	400	16
St. Vincent	53	10.7	63	109	16
Martinique	321	3.5	399	360	12

Sources: CTO (1993) and de Albuquerque and McElroy (1992).

- Note:
1. Computed as: [(No. Stayovers x Ave. Stay) + No. Cruise]/  
(population in 000s x 365).
  2. Includes many private yacht visitors.
  3. Estimated.

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