Environmental and Natural Resources Policy and Training Project

EPAT/MUCIA

United States Agency for International Development

"Institutional Mechanisms for Coastal Resource Management and Protection in St. Lucia"

By
Paul Lorah
Dennis Conway
Ed Jackiewicz
Department of Geography
Indiana University

Supplementary Paper No. 4

Printed July 1995

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Paul Lorah
Dennis Conway
and
Ed Jackiewicz

For more information, contact the authors at:

Department of Geography
Indiana University
Student Building 120
Bloomington, IN USA 47405

Tel: (812) 855-6303
Fax: (812) 855-1661
Email: plorah@indiana.edu
Email: conway@indiana.edu
Email: ejackiew@indiana.edu

For copies of this publication, contact:

Ellen A. Maurer
Communications Director
EPAT/MUCIA Research & Training
University of Wisconsin-Madison
1003 WARF Office Building
610 Walnut Street
Madison, WI 53705-2397

Tel: (608) 263-4781
Fax: (608) 265-2993
Email: eamaurer@facstaff.wisc.edu

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 several natural resources management programs in St. Lucia that attempt to balance the need for environmental preservation and economic security. It includes background information on the economic, demographic, and environmental context shaping management decisions in St. Lucia and the nature of the current threats to St. Lucia's most vital natural resources. It concludes with several lessons learned from successful cases that provide policymakers with useful insights in dealing with small island natural resource preservation and development.

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 $2,500. 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.

David Hales
Deputy Assistant Administrator
Center for the Environment
USAID/G/ENV
Washington, D.C. 20523

William Sugrue
Acting Director
Office of Environment & Natural Resources
USAID/G/ENV/ENR
Washington, D.C. 20523

Institutional Mechanisms for Coastal Resource Protection in St. Lucia

By

Paul Lorah
Dennis Conway
Ed Jackiewicz

July 1, 1995

Epat #221 prepared for the Midwest Universities Consortium for International Activities, Inc.

Paul Lorah is a doctoral student at Indiana University, Bloomington (USA)

Dennis Conway is a Professor of Geography and Departmental Chair at Indiana Universaity, Bloomington (USA).

Ed Jackiewicz is a doctoral student in the Department of Geography at Indiana University, Bloomington (USA)

This publication comes from the USAID-funded Environmental and Natural Resources Policy and Training Project--EPAT/MUCIA--, implemented by the Midwestern Universities Consortium for International Activities, Inc. Views, interpretations, and any errors are those of the authors and should not be attributed to USAID, MUCIA, their respective institutions, the United States Government, or anyone acting on their behalf.

I. SMALL ISLAND CONTEXT

I.1 Island Setting

St. Lucia is located at the heart of the Windward Islands in the Eastern Caribbean, nestled between Martinique to the north, St. Vincent and the Grenadines to the south, and Barbados to the southeast. This strikingly beautiful volcanic island is ringed by coral reefs, seagrass beds, white sand beaches and occasional mangrove forests. St. Lucia's lowlands are intensively cultivated, and agricultural clearing is encroaching on the lush tropical rainforests blanketing the mountainous interior. The combination of a humid tropical climate and steady trade winds results in pleasant year-round temperatures generally ranging between 70 and 80 degrees Fahrenheit.

St. Lucia's population is approximately 140,000, and is projected to double in just 43 years (GOSL, 1991). This growth is taking place during a period of rapid economic expansion, based largely on agriculture and tourism. A combination of population growth, increasing consumption, and development of the island's tourism infrastructure is intensifying the pressure on the island's natural resource base, and the resulting environmental degradation poses a serious challenge to St. Lucia's economic security.

Environmental decline in St. Lucia is especially threatening because the economy is dominated by agriculture and tourism, both of which depend on a healthy natural environment. Fertile volcanic soils and reliable rainfall are the foundation for export oriented plantation agriculture, while natural beauty is now the dominant source of foreign exchange, as visitors (and their credit cards) are attracted by the lure of sparkling waters, coral reefs, and pristine beaches surrounding a lush tropical paradise. Both agriculture and tourism are constrained by natural limits, and both are threatened by the environmental damage their own growth causes. If sustainable development is to be attained in St. Lucia, the link between economic security and environmental health must be recognized, and the island's natural limits must be respected.

Environmental constraints need not hamstring economic development, however. According to Chase (OECS, 1993: 1)

> "In light of the high dependance on and subsequent intense utilization of natural resources, the ultimate goal of environmental management in.... (the Caribbean) should be towards the maximizing of benefits from those resources, while concurrently maintaining the sustainability of the fragile and limited resource base".

With the above perspective in mind, this working paper focuses on a number of progressive natural resource management programs attempting to balance the need for environmental preservation and economic security in the Caribbean. This focus enables us to distill the common denominators among institutional mechanisms and policy options that successfully promote environmentally sound management policies.

To accomplish this, the working paper first outlines the economic, demographic, and environmental context shaping management decisions. Following sections focus on the nature of the threats to St. Lucia's most vital natural resources, and on recent resource management initiatives responding to these threats. The final section presents lessons for progressive policy making based on successful cases.

I.2 Economic Profile

Agriculture dominated St. Lucia's economy for over 300 years. Over this period, the island's economic base shifted several times, as the production of mixed crops gave way to sugar plantations, and later, as sugar plantations were converted to banana plantations. Today, a more radical shift is taking place--tourism has recently supplanted agriculture as the island's largest economic sector (*Figure 1.1*). Tourism's relative contribution to GDP has increased by over 250 percent in the last three decades, while agriculture's relative contribution fell by just over 50 percent (CCA/IRF, 1991).

There are a number of reasons for agriculture's inability to match the growth of tourism in recent years, including damage from hurricanes, low productivity, and market constraints (UNIDO, 1987). In addition to these constraints, limits imposed by size and topography are becoming increasingly important. The surface area of the island (616 square kilometers) is smaller than the area covered by some U.S. cities. Similarly, the mountainous interior is difficult to farm sustainably, as its steep slopes are especially vulnerable to soil erosion. Because of this, virtually all of the island's arable land is under cultivation. By one estimate, only 10 percent of the island is considered suitable for agriculture, whereas 35 percent is currently under cultivation (World Bank, 1993).[1]

Because the best agricultural land is already under cultivation--future agricultural expansion will only take place in areas formerly considered too marginal (and vulnerable) to farm. The result is likely to be deforestation, erosion, and eventually, sedimentation of coral reefs (CLI, 1992). The expansion of agriculture into increasingly marginal areas also damages watersheds and lowers water tables (CCA/IRF, 1991). In any case, the amount of land devoted to agricultural is actually declining--in 1986 24,000 fewer acres were farmed than in 1961, a decline of nearly 20 percent (Barrow, 1992).

Even though agriculture will likely play a decreasingly important economic role in St. Lucia, its temporary strength, combined with the expansion of tourism, has fueled impressive growth of the island's economy over the last 30 years, with recent annual growth in GDP averaging nearly 5 percent (CIA, 1991). Future growth in the agricultural sector is uncertain, however, and its relative economic importance is already waning. This decline will likely accelerate as the protected markets and favorable currency conditions fueling St. Lucia's recent "banana boom" can not be expected to last indefinitely (CCA/IRF, 1991). In fact, the European Union is currently forcing Britain to lower trade barriers that formerly benefited Geest Industries (which purchases and exports the vast majority of the island's bananas) and St. Lucian banana growers.

The slow-down in agricultural growth notwithstanding, agriculture and tourism still account for nearly two-thirds of the island's export earnings (World Bank, 1993). In an effort to reduce the vulnerability associated with a heavy dependence on just two industries (both facing natural limits to future expansion) the government is pursuing restructuring efforts designed to nurture growth in other sectors of the economy, especially light manufacturing and offshore banking.

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[1] Although this estimate may only refer to land that is suitable for mechanized agriculture, it seems clear that any major expansion of agriculture will be difficult.

Unfortunately, restructuring policies are achieving only small-scale success. Although the offshore banking, insurance, and light manufacturing industries are growing, they are growing slower than the economy as a whole. The result is that their combined contribution to GDP is actually *declining*, and economic diversification based on the growth of these sectors is not taking place *(Figure 1.2)* (GOSL, 1986; Price Waterhouse, 1994).

Despite their unsteady growth and limited contribution to GDP, the manufacturing and offshore finance sectors still deserve government support (Harker, 1990). Unlike agriculture and tourism, these sectors rely largely on human, not natural resources. This means that their growth, in addition to diversifying the export base, lessens dependence on the natural environment. Similarly, Goss and Conway (1991: 323), note that the benefits of export oriented manufacturing in the Eastern Caribbean have traditionally been under-appreciated. This is because the development of manufacturing produces long-term structural changes such as "the acquisition of managerial skills, the development of a competent, flexible workforce and the building of a modern infrastructure", which benefits the economy as a whole.

I.3 Reliance on Tourism and the Need for Coastal Protection

Not surprisingly, the data in *Figure 1.2* also show that during the same period, the contribution of hotels and restaurants (the only segment of the tourism sector directly calculated as a percent of GDP by the government) grew steadily. Other tourist related sectors, such as retail trade, construction, and transportation also grew steadily (GOSL, 1986; Price Waterhouse, 1994).

The competitive advantages of tourism, the environmental and market constraints limiting agriculture, and the hesitant growth of manufacturing, insurance, and banking suggest tourism will remain St. Lucia's largest (if not dominant) sector for the foreseeable future--even if the recent stagnation of banking and manufacturing is only a temporary correction. This assertion is supported by rapid growth in the number of visitor arrivals[2] (*Figure 1.3*).

If St. Lucia's future is to be a sustainable one, the natural resources supporting tourism must be protected. Their loss could lead to an interruption of economic growth, declining living standards, and, potentially, social and political unrest (Simmons, 1993). Although beautiful tropical landscapes alone might not be enough to support tourism--assets such as a vibrant local culture and quality hotels are also important--degraded landscapes will turn visitors away as surely as muggings in hotel lobbies (Hudson, 1986). Because tourism is likely to remain the foundation of St. Lucia's economy, and because its long-term success depends on environmental sustainability, *environmental protection is at least as essential to economic sustainability as diversification into manufacturing and banking.*

Environmental degradation is eroding the foundations of economic security in St. Lucia. In response to this threat, this working paper argues that *the highest priority for sustainable development initiatives should be given to protecting coastal ecosystems, because these areas draw the most tourists.* Although the island's mountainous interior is also important for attracting tourists, coastal zones are at the heart of tourism, providing the basis for activities such as

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[2]The temporary downturn in 1981 is the direct result of the damage caused by Hurricane Allen.

sunbathing, swimming, sailing, fishing, windsurfing, snorkeling, sightseeing, and SCUBA diving, as well as adding to the ambiance of the island's coastal cities and sea-side resorts. Additionally, coastal ecosystems support activities vital to many poorer St. Lucians, such as fishing, aquaculture, and firewood production (from mangrove forests).

Despite this heavy reliance, the government has historically ignored threats to the coastal resource base. Intensive and varied use of the coast for tourism, fishing, urban recreation, and industrial purposes creates tremendous pressure on mangroves, seagrass, and coral reef ecosystems (CIDA, 1988b). A majority of the island's wastewater is untreated, siltation from upstream deforestation is damaging coral reefs, pesticides and other agricultural by-products are washing out to sea, mangroves are under pressure from charcoal production and dumping, sand mining is continuing, some areas are overfished, and fishermen, yaughters, and scuba divers are damaging the coral reefs. Another major concern is hotel development - many claim that the government "wants a huge hotel in every bay".

I.4 Demographic Background

A number of interacting processes increase ecological vulnerability in St. Lucia. One of the most significant is population growth, as increasing numbers of people, with increasing levels of consumption, continue to rely on a finite natural resource base. Although St. Lucia's 1991 census enumerated a total population of 133,308 persons, the National Population Unit estimates that the actual population is about 141,000, since approximately 6 percent of the population was not counted (Prasad, 1994). St. Lucia's population would have been significantly larger, save for extremely high outmigration rates. Between 1980 and 1991 *net* outmigration (the number of outmigrants minus the number of immigrants) was approximately 17,000 persons, or the equivalent of 12 percent of the 1991 population (National Population Unit, 1992).

Despite heavy losses to outmigration, the population continues its historically rapid growth. The data in *Figure 1.4* show the dramatic increase in both population and population density over the last 150 years. The annual population growth rate is 1.6 percent, and the population is projected to double in the next 43 years (National Population Unit, 1992). If this doubling takes place, St. Lucia's population density will be over 1,200 people per square mile within two generations.

This rapid population growth is caused by both high rates of natural increase and the population's age structure. High rates of natural increase result from the wide gap between birth and death rates. Life expectancy at birth increased from 50 years in 1946 to 72 years in 1991. The steady decline in death rates responsible for this improvement has not been matched by an equivalent decline in birth rates (*Figure 1.5*). The rate of natural increase has been declining since the 1960's, and St. Lucia appears to be moving through a demographic transition (aided in part by outmigration of women in childbearing ages). Still, the total fertility rate (the number of births per woman) remains a relatively high 3.1 (National Population Unit, 1992). Additionally, as the population profile in *Figure 1.6* shows, younger cohorts dominate St. Lucia's age structure. In fact, 23 percent of the population consists of females of childbearing age (15-44 years). Even

though the total fertility rate is slowly declining, [3] the "population momentum" inherent in this age structure suggests that crude birth rates will remain high well into the next century, as increasingly large numbers of females reach childbearing age.

Just as St. Lucia's population profile indicates that crude birth rates may be slow to decline, it also suggests other troubles. Increasingly large cohorts will be entering the labor force in the near future, exacerbating already high unemployment rates. Similarly, current economic stress results from high dependency ratios, as 37 percent of the population is under 15 years of age (National Population Unit, 1992). These problems will likely increase the financial pressure on the government to succumb to short-sighted, environmentally unsustainable coastal development policies.

While St. Lucia's population grows, the island is experiencing a similar increase in the number of tourist arrivals. The combined numbers of visitors and cruise ship passengers arriving each year is nearly *twice* the number of St. Lucians. On an hypothetical average day, 279 cruise ship passengers are spending the day onshore, and 4,073 other tourists are staying on the island[4]

The growth of both populations heightens environmental vulnerability. Pressure on the island's finite natural resource base is intensifying as demand for construction sites, agricultural land, water, charcoal, fish, and lumber grows. This population pressure is increasingly focused on coastal areas, which are experiencing the most rapid increases in population density. Expansion of the tourism industry is concentrated in coastal regions, and hotel development is fueling unprecedented economic growth. Similarly, St. Lucia's major urban areas (the Castries-Gros Islet Corridor and Vieux Fort) are located along the coast, and urbanization and suburbanization is being fueled by the lure of tourism related jobs. A prime example of this coastal concentration of population is the Gros Islet administrative area, which, because of annual growth rates averaging 7 percent between 1970 and 1982, has become a "virtual extension of the Castries urban area, (with) the entire coastline from La Toc to Mount Pimart and beyond the base of the Pigeon Island Causeway. . . filling up. . . " (CCA/IRF, 1991: 58).

II. Threats to Coastal Resources

II.1 The Extent of Degradation

Our study focus on the protection of St. Lucia's mangroves, watersheds, beaches, and coral reefs. The extreme stresses associated with development and poorly managed growth are resulting in their degradation, threatening to undermine sustainable development. *Table 1* briefly outlines a number of direct threats to the island's coastal resources, as well as their primary causes and effects.

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[3]Down from 3.4 in 1980 to 3.1 in 1991 (National Population Unit 1992).

[4]In 1990, 101,948 cruise ship passengers visited the island, along with 148,714 other tourists (GOSL, 1991). The number of visitors on the island on any given day can be calculated, given that the average cruise ship passenger stays for one day, and that other visitors stay for an average of ten days (CCA/IRF, 1991).

Mangroves

Mangroves are flooded, coastal forests anchored to the mud by a dense tangle of roots. Their extensive root systems stabilize shorelines by trapping sediment, their wood forms the basis of the coastal charcoal industry, and they provide habitat for many species of birds, fish, and turtles (Bossi and Cintron, 1990). Despite these benefits, mangrove swamps are often regarded as marginal areas and are being systematically misused and destroyed to make way for coastal development.

Mangrove forests cover approximately 200 hectares of coastal zones in St. Lucia. The largest is the Mankote mangrove area, which consists of approximately 40 hectares. Mankote has been the main supply of charcoal for the 15,000 residents of Vieux Fort and its surrounding area. Uncontrolled use and indiscriminate dumping have left Mankote highly degraded (Smith and Berkes, 1993).

Of the fourteen mangrove areas on St. Lucia, only two or three remain relatively intact, the others have all undergone significant change. Choc is now a rubbish dump, Reduit a marina, and Marigot a hotel (although the mangrove forest is largely preserved at this location).

Watersheds

Declining water quality in St. Lucia is the result of agriculture, and more recently, tourism, road building, and residential sub-division development. Since colonial times, "slash and burn" farmers, loggers, and road building crews have been whittling away at the rain forests. Similarly, hotels and residential housing developments are encroaching on protected watersheds. This loss of protective forest cover results in increased surface runoff, declining soil moisture, erosion, and, eventually, sedimentation that damages seagrass and coral reefs and reduces coastal water clarity.

The vast majority of the island's watersheds are degraded by chemical pollutants from fertilizers, pesticides, and herbicides. These pollutants lead to eutrophication, kill larval fish, injure seagrass, lower system productivity, and limit the growth of coral reefs (**CCA/IRF, 1991**).

Improper drainage and residential construction on hillsides surrounding the island's freshwater wetlands at Bois d'Orange in the north has also resulted in accelerating sedimentation. Boriel's swamp near Vieux Fort is filled with rubbish, and upstream deforestation has produces dramatic changes in the local water table, resulting in frequent periods of dry conditions (CCA/IRF, 1991).

Additionally, the consumption of water on St. Lucia has increased from 3.5 mgd (million gallons/day) in 1975 to 10 million mgd in 1990. This substantial increase is the product of rapid tourist expansion, increasing domestic use, urbanization, and industrialization. Also, the excessive use of septic tanks has resulted in waterlogging in some areas and the contamination of both surface and groundwater in others. In 1987, 30 cases of typhoid were linked to freshwater pollution by sewage in St. Lucia (CCA/IRF, 1991).

Beaches

Sand mining is responsible for the majority of beach erosion in St. Lucia, and has degraded the beaches of Cas En Bas, Comerette, Anse Canot, Micoud, Cocodan, Black Bay, Anse Noir, Choiseul, Anse L'Ivrogne, Malgretoute, Canaries, and Marisule. Between 1969-1970, 110,000 cubic yards of sand were extracted from local sources to be mixed with imported cement to make

concrete. By 1984, 134,000 cubic yards of sand were extracted. Sand is removed faster than it is replenished in St. Lucia, and the dramatic increase in the volume of sand lost has resulted in unsightly pits and holes in beaches (CCA/IRF, 1991), which reduces their amenity, aesthetic quality, and recreational potential.

The environmental externalities associated with sand mining include beach erosion, saltwater intrusion, increasing damage associated with salt spray, and the loss of dune vegetation in coastal areas. Dune vegetation is also being destroyed by beach buggies and off-road vehicles. This has both aesthetic and functional consequences. Dunes act as vegetative buffers against wave action, and their decline is associated with increased damage to buildings and property in the coastal areas (CIDA, 1988c).

Coastal and Marine Resources

A combination of increasing demand for fish and improper fishing techniques is leading to overexploitation of local fisheries. Similarly, activities such as dredging and dynamite fishing have endangered the livelihoods of fishermen throughout the island by severely degrading offshore habitats.

A wide range of threats to marine habitats exist. One local case is the construction of the causeway joining Pigeon Island and the mainland which has disrupted offshore currents and the movement of schools of jacks and mackerels which the fishermen previously caught. This disruption is believed to be partially responsible for the fact that the number of fishermen in this region has recently dropped by two-thirds[5]. The same is true for lobster, conch, and seagrasses which have all but disappeared from this area. Other threats include water pollution from untreated sewage, siltation caused by deforestation, and cyanide, which is used to stun fish so that they can be captured and sold to pet stores for use in aquariums (CCA/IRF, 1991). Although the cyanide only stuns fish, it can kill coral.

In St. Lucia, sea urchins have been heavily overexploited in many regions. The gonads of both sexes of sea urchins are considered to be a delicacy and therefore demand a high price and are an attractive source of income. Sea urchins are a shallow water species and clearly within the range of free divers, and therefore vulnerable to over-harvesting. The places most affected by the exploitation of sea urchins are Aupicon, Laborie, and Maria Island (Smith and Berkes, 1993).

Coral Reefs

Coral reefs are important for beach protection, habitat, fisheries and are the foundation for the island's rapidly growing sport diving industry. They are especially vulnerable to water pollution (the result of agricultural runoff, siltation, and untreated municipal waste) dredging (associated with the construction of the Pigeon Island causeway and of marinas), mechanical damage (resulting from boat anchors and fishing gear), and the effects of a growing tourism industry (the anchors of dive boats and yachts have reduced many of the reefs to rubble, and divers can cause severe damage simply by standing on the reefs) (CCA/IRF 1991). Popular dive sites in St. Lucia are particularly vulnerable to divers and anchors from visiting boats. The coral

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[5]Another factor in this decline may be the role of competing employment opportunities for fishermen in the tourism industry.

reefs at Vieux Fort, Castries Harbor, Cul de Sac, Rodney Bay, Vigie Beach, and Pigeon Island have all been adversely affected by dredging.

Reefs have also been degraded by dynamite fishing. Fortunately, blast fishing has been outlawed, and theoretically results in a jail sentence (Stone, 1988). The aforementioned cyanide fishing has also jeopardized the reefs, while growing amounts of silt and pollution are evidenced by the increasing amount of dead coral seen along St. Lucia's coastline. The importance of reefs has already been acknowledged and their value to the local community well-documented, yet they continue to be systematically destroyed.

III. The Context of Coastal Resource Management Decisions

> ". . . if concerted attention is not given to halting deterioration of the country's inland and coastal natural resources, serious and possibly irreversible damage, with correspondingly serious economic consequences will result" (CIDA, 1988b: 2-117).
>
> ". . . the legislative infrastructure in Saint Lucia for environmental management is, for the most part, outdated and inadequate to cope with current problems. . . " (CLI, 1992: 255)

As economic dependence on tourism increases, the industry's environmental foundation is increasingly threatened by its own expansion. This contradiction is the greatest single threat to sustainable development in St. Lucia. As a first step towards the creation of sustainable policies, this section outlines the context in which coastal management decisions are made. The local context includes lack of baseline data, relevant legislation, the quality of enforcement efforts, structural barriers to coastal protection, and political and economic pressures encouraging unbridled coastal development. The regional context is also addressed, using McElroy and deAlbuquerque's (1991) tourist destination life cycle model both to gauge the amount of development pressure St. Lucia is experiencing relative to similar tourist oriented islands, and to extrapolate future coastal conditions in St. Lucia by looking at other Caribbean islands that are 10 to 20 years farther down the mass-tourism development path. Section IV which follows, *Recent Initiatives in Coastal Resource Management*, focuses more specifically on the coastal management context by examining the role international, regional, national and local institutions play in protecting the island's coastal areas. The two are complementary, yet additive.

III.1 Lack of Baseline Data

In St. Lucia, the lack of comprehensive baseline data undermines efforts to formulate appropriate coastal management strategies. A comprehensive understanding of the coastal environment should provide decisionmakers with a solid foundation for making informed decisions about environmental regulation, enforcement, and planning (OECS, 1993). However, without essential baseline data, environmental change cannot be accurately assessed, vulnerable areas cannot be thoroughly identified, specific threats may remain unnoticed, and appropriate responses to coastal degradation are less likely. This deficiency slows the pace of environmental protection, by obscuring the extent of coastal degradation and failing to focus attention on the economic costs associated with coastal decline. Even where scattered information on the coastal

environment has been collected[6], there is no centralized attempt to summarize, analyze, and disseminate it, or to apply this knowledge in coastal management strategies (CCA/IRF, 1991).

This "information gap" results in reactive, not proactive coastal management strategies. Management efforts are currently confined to controlling only the most damaging activities, and only a few key habitats are monitored for environmental degradation. A framework for applying even this limited information to long-term planning of resource enhancement does not exist (CCA/IRF, 1991). Another result of the baseline data "information gap" is that environmental regulations do not address unbridled coastal construction and land-use conversion, which constitute the most serious threats to coastal environments. Similarly, the lack of hard evidence documenting environmental degradation limits political will to enforce existing regulations.

III.2 Coastal Legislation

Table 2 details environmental legislation specifically designed to protect coastal resources. The regulations in *Table 2* cover a wide range of coastal management concerns, including sewage treatment, pesticide control, fisheries management, and the establishment of parks. Despite the lack of legislation concerning land use planning, the existence of environmental laws seems to indicate that some coastal resources are being protected. Unfortunately, this is not the case, as the mere existence of regulations (even ones as weak as St.Lucia's) can lead to an unjustified belief that adequate environmental protection is taking place. Many of these regulations have not been fully implemented, many are out-dated, and many lack mechanisms to ensure effective implementation and are therefore not systematically enforced (CIDA, 1988c).

III.3 Barriers to the Enforcement of Existing Regulations

Although St. Lucia has the beginnings of a system of protected areas "on paper", the weakness of existing environmental legislation means that very little environmental protection actually takes place (Hudson, Renard, and Romulus, 1992). This weakness is exacerbated by the fact that a number of ministries are charged with protecting coastal environments, but little consultation or coordination between them takes place (OECS, 1993). Environmental management authority is fragmented, monitoring and enforcement efforts are diluted and inefficient, and environmental considerations are often left out of the national planning process (CCA/IRF, 1991).

Even though the legislation in *Table 2* delegates regulatory powers to specific agencies, administrative overlap and conflict can occur because of the lack of clearly defined lines of responsibility. Without clear demarcation of the areas of jurisdictive control, repetition of activities and fragmentation of manpower often results (OECS, 1993). Administrative overlap, however, is less likely to result from this uncertainty than are gaps in enforcement that result when ministries assume that another agency is responsible for enforcement (CCA/IRF, 1991).

Another reason for the lack of environmental enforcement is that regulations supporting environmental legislation are often weak or non-existent. Even when regulations do exist, the prohibitive expense of funding enforcement personnel limits their power (CIDA, 1988b).

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[6]By the Fisheries Management Unit, local NGOs and student volunteers, for example.

Similarly, officials with requisite authority appear to avoid their responsibilities (particularly in rural areas); the Royal St. Lucia Police Force's marine unit is constrained by limited mobility; enforcement is counterproductive to the mission of fisheries extension personnel; and inadequate communication systems prevent field personnel from reporting offenses in time for violators to be apprehended (CIDA, 1988b).

III.4 Structural Barriers to Effective Coastal Conservation Programs

In addition to the lack of baseline data, weak environmental legislation, and barriers to the enforcement of existing environmental regulations, a number of other structural barriers to coastal protection need to be addressed (Hudson, Renard, and Romulus, 1992; CCA/IRF, 1991; CIDA 1988b; CIDA, 1998c, Trist, 1987).

***The need for more environmental awareness and will**-St. Lucia is probably better off in this area than many other Caribbean islands, and there are a number of signs that this situation is improving. This is partially due to the result of the educational efforts of the St. Lucia National Trust, RARE, the Caribbean Natural Resources Institute and the Forest and Lands Department which has created a series of newspaper columns, educational materials for schoolchildren, and a nature trail at the Department's headquarters. Still, the level of environmental awareness of the average St. Lucian is relatively low, and the developmental constraints and economic costs associated with environmental degradation are not widely understood. Fortunately, there are signs that this situation is changing, especially among the most educated segments of the population.

***The strength of political and economic forces encouraging unsustainable use of natural resources**-The long-term costs of environmental degradation have been discounted by a wide range of political and economic policies and approaches encouraging the rapid economic growth associated with laissez-faire coastal development. Pressures on the government to promote immediate gains in economic growth and employment gives priority to short-term development concerns. Large numbers of low-skill, low-wage jobs (as maids, or in construction, for example) are one result of the government's encouragement of high density, mass market tourism. Although this may relieve short term unemployment concerns, this form of development may not be in St. Lucia's long-term economic and environmental interest.

***Absence of a national land use plan**-Historically, the approach to planning in St. Lucia has been to consider each project as an isolated activity, ignoring user conflicts, externalities, and optimum land use considerations best dealt with via a comprehensive planning approach and a formal environmental impact assessment procedure. The last national land use plan did very little to protect the environment, and was created in 1977. It is scarcely a blueprint for the 1990's. Without zoning regulations associated with a comprehensive national land use plan, environmental concerns and the need to preserve areas of cultural and natural significance are not likely to be considered when development projects are evaluated.

***The shortage of highly trained resource managers-**Because of St. Lucia's small size and limited economies of scale, environmental protection measures are relatively expensive. The costs of training and supporting adequate technical, managerial and enforcement staff are spread across a population of less than 150,000 people. Also, the island's size precludes the local availability of the highly technical, specialized university education that effective natural resource managers require. Even when quality graduates return from the University of the West Indies or from universities in Canada or the U.S., they may not chose to work in the public sector. A combination of low wages and historically high outmigration rates may result in the loss of the island's most qualified resource managers as they move off island or into the private sector in search of higher wages.

The Environmental and Coastal Resources Project, sponsored by the Organization of Eastern Caribbean States (OECS), identified the lack of adequate staffing and a high rate of personnel turnover as major constraints on environmental monitoring programs in the Eastern Caribbean. "This has resulted in a sporadic schedule for the collection of data and the preparation of reports. In certain instances, the cessation of monitoring programs has ensued as a consequence. Insufficient training has resulted in substandard reports being prepared" (OECS, 1993).

***Land Tenure-**Land tenure in St. Lucia is a convoluted mix of British common law, French civil code, and local traditions. The complexities stemming from this system are a barrier to national land use planning (CCA/IRF, 1991). St. Lucia's land titling and registration system is improving however, partially as the result of a USAID funded project. Still, the majority of banana growers do not have access to adequate amounts of land (69 percent of banana growers had access to less than 1 acre of land in 1982, and only 8 percent had access to more than 5 acres) (LAB, 1987). Additionally, only 27 percent of the island's agricultural parcels are worked by their owners. The vast majority of parcels are sharecropped, rented, family lands, or squatted (CCA/IRF, 1991). Without the security of land tenure, farmers do not have strong vested interests in the long-term health of the land they farm or incentive to implement conservation measures.

***The desire for short-term economic gains overwhelms long-term environmental concerns-** Unbridled coastal development is actively encouraged by the St. Lucian government, which views the expansion of mass market tourism as a short-term means of addressing the problems of unemployment and external debt (Devaux, 1994).

***The barriers to community participation in resource management decisions imposed by a historically top-down management style at the national level-** The centralized structure of government planning and decisionmaking is largely a hold-over from the British colonial system.

III.5 Specific Threats to Coastal Environments

Tourism's rapid growth threatens to undermine the island's future security. The expansion of the tourist infrastructure is the primary cause of the degradation of the very areas the industry relies on to draw visitors. High-density, mass market, beach resorts are beginning to dominate the market, fueling unbridled coastal development. According to some officials, the government has

been "hell bent for development at all costs" pursuing a program of "crash development" with "Singapore as a developmental model". Indeed, the government has offered tax holidays for major hotel developments, and approves construction proposals with very little regard for their environmental costs. Recent examples of ill-advised projects include a large resort constructed on the Jalousie Plantation which is located in a proposed national park containing the famous Pitons (a national symbol: rugged, heavily forested twin peaks rising out of the Caribbean), and approval of a hotel project on 400 acres of (formerly) protected and vulnerable mangrove forest at Savannes Bay that locals rely on for charcoal, recreation, and as a nursery for commercially valuable fish.

There seem to be four major factors behind the government's willingness to allow uncontrolled coastal development to continue unabated. *First*, the island suffers under a heavy burden of trade deficits and, increasingly, World Bank pressure to restructure the island's economy in an attempt to increase export earnings. The government's primary response is to encourage growth in tourism revenues via investment in large hotels. *Second*, about 20 percent of St. Lucia's population is unemployed, and there is a great deal of political pressure to create as many jobs as possible, as rapidly as possible. Construction and staffing of large hotels are seen as the short-term answer to this problem. *Third*, many of the poorest St. Lucians are heavily involved in the island's informal economy. Activities in this sector include fishing, charcoal production, making souvenirs for tourists, seamoss collection, and small-scale agriculture. Some political leaders view this informal economy as a threat: it is not regulated or controlled, it does not produce tax revenue, and many of its participants are openly hostile to the government. In this case, creating jobs in the tourism sector is seen as a means of relieving political pressure and bringing people into the formal economy. *Fourth*, loss of protected trade status with Britain is threatening to turn the island's banana boom into a banana bust. The potential loss of agricultural jobs may be another factor in the rush to create jobs in the tourism sector.

III.6 St. Lucia's Development Path

Tourism's rapid growth and economic primacy came relatively late in St. Lucia, so the developmental pressures outlined above have not yet affected all of the island's coastal areas. These less developed areas are under threat, however, as St. Lucia seems to be following a development path pioneered by a number of other Caribbean islands with fully mature tourism industries threatened by degraded natural resource bases. The lessons gained from their (Aruba, Curacao, the U.S. Virgin Islands. . .) development histories can inform resource management programs in St. Lucia, while the ecological condition of these islands can be used to extrapolate the amount of environmental degradation St. Lucia can expect, if it continues along the mass-tourism path of short-term prosperity.

A number of researchers (Butler, 1980; McElroy, 1991; McElroy and de Albuquerque, 1991) have commented on the similarities between the product life cycle model used in marketing and the generalized development path taken by islands that are tourist destinations. The Destination Life Cycle Model (Butler, 1980) claims that islands pass thorough six distinct developmental stages as their tourism sectors evolve. This evolution progresses from the early stages of involvement and exploration (slow growth), through the intermediate stage of development and consolidation (rapid growth) and ends with stagnation and the potential for either decline or

rejuvenation (slow growth or decline).

McElroy and deAlbuquerque (1991) have modified this approach, consolidating the life cycle framework into three stages of development: *first*, a low density, long staying style; *second*, an intermediary style found in St. Lucia; and *third*, a high density, mass market approach. The low density, long staying phase is characterized by discovery, slow growth, eco-tourism, retirement homes and part-year residences. Islands in this stage include Dominica, Montserrat and Saba. The intermediate stage is characterized by rapid growth in tourist arrivals and hotel construction, as well as a reliance on activities such as fishing, diving, yachting, and cultural tourism. Islands in this stage include St. Lucia and the British Virgin Islands. The high density mature stage is characterized by a large tourist infrastructure based on artificial attractions (gambling, duty free shopping, convention centers) not natural beauty. Islands in this stage include Aruba, Curacao and the U.S. Virgin Islands (McElroy, 1991).

As islands like St. Lucia move towards the third stage, their environments, especially their coastal zones, become increasingly degraded. They suffer from crowding and are plagued by

> "reef damage and mangrove destruction, loss of species diversity and biological productivity, deteriorating infrastructure and utility breakdown, marine pollution from overurbanization and inadequate waste disposal, crowding, rising inflation and other social ills" (McElroy and deAlbuquerque, 1991: 260-261).

St. Lucia is clearly in danger of moving toward a high impact, mature tourism industry where artificial attractions substitute for many of the unique natural attractions lost to (over)development. One problem with this path is that it can lead to an increasing proportion of tourist dollars going to all-inclusive packages, which tend to reduce the tourist multiplier. Another is that the artificial attractions luring tourists to third stage islands (large chain hotels and restaurants, casinos, shopping arcades. . .) are ubiquitous--virtually indistinguishable from the tourist infrastructures of other third stage islands, or Florida for that matter. This form of development may alienate St. Lucians on their own island, while diluting local architectural, culinary, and musical styles--drastically altering the island's character by replacing its unique natural attractions and charm with a counterfeit, Disney-like atmosphere catering to the lowest common denominator of tourist desires. As more islands move towards third stage tourism, competition for visitors drawn to Holiday Inns and casinos will intensify. At the same time, many of the unique features differentiating them from the islands they compete with for tourist dollars are lost. As more islands began to look increasingly like Florida or Hawaii, fewer Americans and Canadians will be willing to pay the additional costs associated with traveling to the Caribbean.

Because St. Lucia is still at an intermediate stage, it does not have to take the high-density path. Its style of tourism might better be based on the island's vibrant culture and natural beauty, not imposed on top of them. It is still possible that a measured balance between development and preservation can be achieved, if immediate development needs are tempered by environmental policies designed to protect the island's natural beauty and, consequently, future economic viability based on an appropriate low density mode of tourism. The following section outlines some of the recent initiatives in coastal resource management that seem to be leading the island toward a more sustainable version of economic development, one where economic goals and environmental protection are complements, not alternatives, and where coastal zones act as

catalysts for growth--facilitating development and community involvement but remaining largely unchanged in the process.

IV. Recent Initiatives in Coastal Resource Management

> "In its efforts to manage the environment, St. Lucia is fortunate that it has been an informal and formal centre for environmental study for many years.... regionally oriented centers for the environment... are presently centered in St. Lucia. Strong national NGOs have also been developing and evolving parallel to these more regional organizations" (CIDA, 1988c: 2-117).

This section outlines the most successful environmental protection institutions and initiatives in St. Lucia. It is divided into four parts, focusing on the role institutions play in coastal resource protection at the international, regional, state and local scales. Each category focuses on how a specific institution has successfully approached the problem of coastal protection by addressing one or more of the above barriers to effective natural resource management. The final section of this working paper focuses on the common denominators of the most effective programs and makes suggestions for future development projects based on their experiences.

IV.1 International Institutions and Coastal Resource Protection

A number of international organizations have played a vital role in supporting local and regional coastal protection initiatives by providing both funding and expertise. One of the common denominators underlying the most effective of these institutions (United States Agency for International Development (USAID), The World Wildlife Fund, the Canadian International Development Agency (CIDA), and Canada's Special Project Implementation Fund (SPIF)) is their recognition of the value and importance of capitalizing on local traditions of community involvement to promote development efforts.

Large international development agencies increasingly acknowledge that "(s)olutions began at the local level, even for environmental problems with global implications. . . (and that) environmental assistance programs thus must empower individuals and communities. . . to help articulate local concerns and involve individuals and communities in decisions that affect local and global environments" (USAID, 1994: 14). Integral to these agency plans must be the development of constructive partnerships between donors, multi-lateral agencies, international, regional and local NGOs, local government and community stakeholders--the local resource users with the most to gain from protecting the local environment, and the most intimate understanding of local ecosystems and their economic uses.

Although international development agencies have a role in designing management projects, perhaps their greatest contribution has been as a catalyst for locally conceived development initiatives. Many of the most successful coastal management initiatives they are involved in were originally initiated by local and regional NGOs. As the value of these initiatives became apparent, many gained the support of the St. Lucian government and, eventually, of international institutions that played a supporting role by providing essential funding and expertise

CIDA, for example, has provided substantial support for existing natural resource conservation programs run by the government, especially in the areas of forestry and fisheries--helping the *Fisheries Management Unit* and the *Department of Forest and Lands* formulate long-

term development plans. Additionally, the Fisheries Complex in Castries Harbor (operated by the St. Lucia's Fish Marketing Cooperation) was supported by CIDA funding (CCA/IRF, 1991). CIDA also funded the region-wide Caribbean Environmental Strategy, a three volume report providing a "blueprint and underlying rationale for priority environmental management initiatives over the next ten years" (CIDA, 1988: viii).

USAID

Although it helped fund a number of effective natural resource management programs[7], USAID's most important contribution to natural resource protection in St. Lucia is its recent funding of research that led to the creation of St. Lucia's new *System of Protected Areas* (SPA). The Plan for the System of Protected Areas, completed in 1992, is especially important because it is the first strong sign that concerns surrounding St. Lucia's lack of *integrated natural resource management and phased planning* are being addressed, and that the government is beginning to support environmental protection measures that promote long-term economic security (Devaux, 1994).

If fully implemented, the SPA will establish a network of 27 marine and terrestrial management areas (over a period of 27 years) designed to protect St. Lucia's environmental and cultural heritage. Approximately three-quarters of these management areas are located in coastal zones. They range in size from the St. Lucia Forest Reserve (7,296 hectares) to the Taipon Historic Area (7 hectares), and include national landmarks, national parks, protected landscapes and historic areas in which sustainable multiple uses will be encouraged and human habitation allowed. Additionally, several more heavily protected forest, wildlife, nature and marine reserves will be created (Hudson, Renard, and Romulus, 1992).

Establishment of the SPA's protected management areas addresses a number of concerns outlined in the first two sections of this paper. According to *The Plan for a System of Protected Areas*, (Hudson, Renard, and Romulus, 1992), the SPA has nine core objectives, that if met will:

*Sustain the quality and productivity of critical ecosystems in order to benefit forestry, fisheries and tourism
*Protect the island's biodiversity by conserving critical habitat
*Protect natural and cultural heritage
*Maintain the water supply by protecting watersheds
*Restore degraded lands and encouraging the rational use of marginal resources
*Encourage research on St. Lucia's cultural and natural resources
*Educate St. Lucians about the value of their natural and cultural heritage
*Build self-esteem and patriotism via appreciation of that heritage
*Provide places for recreation, enjoyment and inspiration

Although USAID funding was an important component of the SPA, the impetus for this

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[7]Including the island-wide Land Registration and Titling Project, support for a management plan for the national parks system, a geothermal energy project, and support for the 1986 agricultural census (CCA/IRF, 1991)

project was local:

> "(the SPA) is one of the manifestations of a *growing realization within the population and among governmental and non-governmental institutions* that the natural and cultural heritage of the country is subject to major and unprecedented threats. Yet, that heritage, if properly managed, could represent one of the country's principal assets in its search for development" (Hudson, Renard, and Romulus, 1992: 1. (*Italics added for emphasis*)).

IV.2 Regional NGOs and Coastal Resource Protection

Regional NGOs also achieve success in St. Lucia by focusing on local concerns and needs, as opposed to imposing external developmental goals. Another hallmark of regional organizations is a broad-based development philosophy founded on the idea that ecological decline cannot be addressed without simultaneously focusing on the underlying political, social, demographic and economic problems responsible for creating pressures leading to unsustainable land-use decisions. This integrative approach, based on in-depth knowledge of the local context, demands a long-term commitment. While the involvement of international agencies in coastal management initiatives is often based on narrowly focused, short-term goals, regional (and local) NGOs are committed to prolonged efforts, viewing development as a continually evolving process, not as a project.

Another difference between regional and international institutions is that regional institutions are much more likely to cooperate with each other. International institutions rarely join forces to work on coastal protection, while regional NGOs actively seek input and support from each other. This may be an acknowledgment of the relatively limited resources regional groups possess and the consequent need to draw on each others complementary strengths, or this may be a sign of commitment to solving local problems, regardless of turf battles and external political pressures that create a need to demonstrate what "we" accomplished.

CANARI

The Caribbean Natural Resources Institute (**CANARI**) is one on the most successful and influential regional NGOs operating in St. Lucia. It promotes environmental conservation and economic development by seeking to "strengthen the role of Caribbean communities and their institutions in the management of the natural resources critical to their development" (Smith, 1992, p. 20). This approach is especially effective in attacking the barriers to coastal management and protection, and CANARI has scored notable successes in the areas of lowering the barriers to community participation in resource management, fighting to demonstrate the long-term social, environmental and economic benefits of environmental conservation, securing land use rights, and collecting baseline data on coastal ecosystems.

CANARI is especially active in the South East Coast of St. Lucia, where it has been involved in demonstrating how sustainable development might be achieved in the Caribbean as a whole. This coastal region is an economic and environmental microcosm of the larger Caribbean region, containing tourism, light manufacturing, fishing, charcoal production, and agriculture, as well as coral reefs, mangroves, seagrass, beaches, islets and cliffs (Stone, 1988). It also had examples of both a strong informal economy and a modern export economy, and like many other Caribbean islands, there was overexploitation of potentially renewable resources. Also, as in many Caribbean regions, administrative control is centered elsewhere and took the form of top down planning with little appreciation for local needs and the benefits of stakeholder self-management

(Renard, 1994).

Prior to 1960, much of the South East Coast's environment was protected, as it served as a British (and later, as an American) air force base. Unfortunately, when the base closed, the coastal zone degraded rapidly under the pressure of overfishing (often, using dynamite), mangrove destruction (for charcoal) and rapid development (Renard, 1994). Sea bird populations were dropping as their nests were plundered for eggs, and the populations of commercially valuable fish, lobsters, seamoss, turtles, and "sea eggs" were also in rapid decline (Smith and Berkes, 1993). Similarly, between 1960 and 1980, a number of resource user conflicts had developed in the area. Sand mining and pollution from light manufacturing damaged the newly established tourism industry, while charcoal production degraded the mangrove areas many species of commercially important fish use as nurseries. At the same time, pollution from nearby light manufacturing was increasing (Stone, 1988).

Building Local Support

Despite the scope of these problems, environmental concerns about the South East Coast tended to focus on just two areas: the Maria Islands and the mangroves in Savannes bay. Yves Renard and others at CANARI quickly realized that because of the multitude of ecological, social and economic linkages in the area, environmental protection efforts would fail if the reserves were managed in isolation from the surrounding communities (Stone, 1988).

Without community-level education, environmental protection would not have enough local support to be feasible in the long run, and without local support and involvement, managing and protecting these reserves would be extremely difficult. Because of this, the scope of CANARI's mission was broadened to include community empowerment, economic security and responsible use of *all* of the South East Coast's resources, both natural and human. CANARI, in partnership with the local community, dedicated itself to the goal of increasing local standards of living, fostering open communication between local resource users, and safeguarding the local environment by giving the local community financial incentives to conserve the resource base their economy relied upon (Stone, 1988).

Starting in 1981, CANARI built this support by soliciting input from local school groups, fishermen, small business owners, teachers, charcoal collectors, and community leaders. A series of public meetings was held to identify common goals such as encouraging profitable and sustainable use of the region's fisheries and mangroves, and attracting tourists to the new nature reserves (Renard, 1994). By participating in the meetings that shape development policies, individuals and institutions become vested in seeing the project succeed as their involvement leads to a sense of ownership, control and responsibility (Hudson et al. 1992). As a direct result, the scope of CANARI's long-term mission was broadened to include community empowerment, economic security and responsible use of *all* of the South East Coast's natural resources. For CANARI, development became a process, not a project (Cumberbatch, 1994).

Community Management

One of the first steps CANARI took to involve the local community was to recruit high school science students, charcoal cutters and fishermen to collect data on the status of natural resources and their level of use (Renard, 1994). A site receiving special attention was the Mankote mangrove, where a 1985 descriptive survey was followed by a monitoring program in which the

amount of monthly charcoal production was tracked by the cutters themselves (Smith and Berkes, 1993).

In conjunction with these surveys, a community based management program designed to strengthen the organization and resource-use rights of cutters was initiated. With CANARI's assistance, the charcoal cutters formed an informal cooperative. Previously, the mangrove had been an open access resource, and cutters felt little responsibility for conservation. The cooperative, however assigned charcoal producers individual cutting areas, giving them incentives to sustainably harvest their areas. The realization that their economic interests are best served by sustainable use of their cutting areas, along with an increased sense of responsibility and control has produced changes in harvesting practices among the cutters. They are no longer harvesting indiscriminately, as clear cutting has been replaced by methods of harvesting that remove the largest stems, without killing the stump. Similarly, some trees are preserved as sources of seeds, red mangrove along waterways are not cut, and harvesters respect the boundaries of other's areas (Smith & Berkes, 1993. Renard, 1994).

The results of this community management are heartening. According to Smith and Berkes (1993) Between 1986 and 1992, the Mankote mangrove showed some signs of recovery as stem density and the total basal area of timber increased. Additionally, bird hunting was prohibited in the Mankote mangrove in 1986, and trash dumping, once common, has been largely eliminated. By 1990, the mangrove had recovered to the point that it was attracting small numbers of tourist groups--perhaps not enough to be commercially important, but nevertheless this change is a positive sign.

Another group benefiting from CANARI's involvement is the Palmiste fisherman's group. As with the charcoal cutters, CANARI initiated informal meetings among fishermen where common problems were identified, and potential solutions suggested. The result has been the design and construction of a new landing facility, now used for fish cleaning, gear storage, community meetings and as a central location to market fish from (Stone, 1988; Renard, 1992). CANARI has also been involved in similar natural resource projects focusing on commercial sea-moss cultivation (Smith, 1986) and sea urchin (locally known as sea-egg) stocks.

Local Economic Growth

In addition to safeguarding the livelihood of charcoal producers, fishermen, sea-moss cultivators and sea-urchin harvesters, CANARI is also involved in increasing the South East Coast's tourism profile. Between 1983-89, the Maria Islands Nature Reserve and Interpretive Center opened with help from the World Wildlife Fund in an attempt to save two highly endangered species (a ground lizard and grass snake) found only on the Maria Islands (Renard, 1992). (Visitor numbers remain modest.) As a part of CANARI's ongoing community education program, the center's museum attracts busloads of school children on fieldtrips from all over the island (Stone, 1988). The reserve and nature center also attract tourists to the South East Coast, and CANARI has trained several locals as naturalists who supplement their incomes by conducting tours of the reserve several times a week. Protection of the colonies of birds nesting on the Maria Islands, has also helped local fishermen, who relied on them to help locate schools of tuna (Smith, 1994).

During this period, CANARI also implemented a seamoss cultivation project (seamoss is used in

local puddings and drinks, and overcultivation was causing its rapid disappearance in the wild) and was involved in establishing woodlots to relieve some of the harvesting pressure on the mangrove reserve (Renard 1994). Currently, CANARI is continuing to manage the South East Coast in cooperation with local resource users and is involved in implementing similar projects in other regions in St. Lucia.

As the region's economic base broadens and becomes more secure, well-organized groups of natural resource users will increasingly plan for the long term, serving as a strong voice for sustainable use of the environment they depend on. CANARI, in partnership with the local community, dedicated itself to the goal of increasing local standards of living, fostering open communication between local resource users, and safeguarding the local environment by giving the local community financial incentives to conserve the resource base their economy relied upon (Stone, 1988).

IV.3 The St. Lucian Government and Coastal Resource Protection

In general, the St. Lucian government's environmental protection efforts, while better than those of many Caribbean governments, have been limited and ineffective. The lack of concern for environmental issues can be seen in limited natural resource management legislation, fragmented management, and lax enforcement, as well as the continuing approval of hotel construction projects in sensitive coastal areas. Despite these failures, the government has taken some important first steps towards environmental conservation. One of the most important was the creation of the St. Lucia National Trust which manages and protects a number of coastal areas.

The St. Lucia National Trust--"Conservation Through Education, Appreciation and Protection"

The St. Lucia National Trust is one of the island's oldest and strongest institutional advocates for environmental protection. Since its creation in 1975, it has taken on a wide range of conservation responsibilities, and serves as the St. Lucian equivalent of the National Park Service, managing and protecting areas of historical interest or biological importance, including the critical coastal ecosystems of the Maria Islands Nature Reserve, Pigeon Island National Park, and the Fregate Islands Nature Reserve.

When it created the Saint Lucia National Trust in 1975, the government charged it with "preservation of buildings and objects of historic and architectural interest and areas of natural beauty with their animal and plant life" (SLNT, 1994: 1). In 1993, the Trust's mission was broadened, and is now "To conserve the natural and cultural heritage of St. Lucia, for the social, cultural, or economic benefit of present and future generations, through research; documentation; education; public participation; institutional collaboration; and the effective management of sites and properties" (SLNT, 1994: overleaf).

According to the Trust, its main goals include:

*advocating and promoting conservation

*protecting representative elements of the natural and cultural heritage

*encouraging research on St. Lucia's cultural and natural resources

*identifying and documenting archaeological sites and places of natural beauty

*coordinating and exchanging information on National Parks and protected areas and related matters within government, non-governmental organizations, members of the public and with international organizations and also with such other bodies having aims and objectives similar to the Trust (SLNT, 1994: 1).

Because of the scope of these goals, the Trust's mission goes well beyond managing national parks and nature reserves. With the active support of its 400+ members, it also advises the government on environmental issues, promotes environmental awareness, supports conservation research programs, and publishes booklets and a newsletter. The Trust also conducts a lecture series, management workshops, site tours, and volunteer drives (for activities ranging from trash pick-ups to photographic documentation of archaeological sites). Additionally, the Trust runs a number of youth education programs, including the Pigeon Island Summer Club and the Kid's Safari Summer Program, that use workshops, lectures, slide-shows and field trips to promote environmental education and an appreciation of the importance of preserving the island's natural beauty.

The Trust is a curious mixture of public and private elements. Although a majority of its funding still comes from the national government ("the Trust takes money from the government, not orders" says one member), the Trust is steadily being weaned of state support. As the government's contribution to the Trust becomes proportionately smaller (down from EC $1,000,000 in 1995 to an estimated EC $750,000 in 1997/98), the Trust is intensifying efforts to generate an increasing proportion of its own revenue via admission fees, membership dues, grants, fundraising events, and donations. Many of these fundraising activities have the added benefit of increasing environmental awareness and local support for coastal conservation. The proceeds from a series of postcards (created by Nobel Laureate and St. Lucian, Derek Walcott) support the National Trust and celebrate St. Lucian landscapes and culture. Earth Day Celebrations, membership retreats, tours of nature reserves conducted by the Trust's naturalists, and the annual Heritage Motor Hunt are other examples.

IV.4 Local NGOs and Coastal Resource Protection

St. Lucia has a long tradition of community involvement in rural development. The island's small size, the "face-to face" character of Caribbean culture, the accessibility of decisionmakers, and the permeability of institutional barriers separating planners and decisionmakers from the general public all favor participatory approaches to development (Trist, 1987). This tradition of community involvement is also strengthened by the pervasive influence of Christian churches which encourage and organize community development and promote self-help and self-reliance (Lionel and Jules, 1987).

A majority of local self-help and community development groups are organized and run by women. "They often constitute the majority in the groups, play active and leading roles in the executive bodies, and--unusual for a Third World country--are more literate and schooled than their male counterparts (perhaps for this reason they play key record keeping and documentation roles in rural groups)" (Lionel and Jules, 1987: 2).

Although local NGOs have historically focused on social, religious and economic issues, as

environmental problems become increasingly publicized, they have become more active in natural resource protection. One of the best examples of local NGOs involved in coastal resource protection is the Soufriere Regional Development Foundation.

The Soufriere Regional Development Foundation and the Soufriere Marine Management Area

Until recently, the coastal zone of the Soufriere region has long been the sight of intense conflict between different groups of natural resource users--yachters, fishermen, and dive operators. Yachts repeatedly moored in prime fishing areas, and their anchors often damaged coral reefs and seagrass beds. Fish pots damaged the reefs they were set on and pulled across, while the non-edible reef fish they caught were rarely returned to the water. The fishermen claimed that local dive operators were sabotaging fish pots (after stealing the fish they contained) to protect the reefs and fish populations from further decline.

This conflict overshadowed the fact that all three groups shared a number of common concerns and goals, including coastal degradation. Untreated sewage and agricultural runoff containing pesticides and fertilizers threaten both fishing and diving, while making Soufriere a less pleasant anchorage. Similarly, the loss of inedible reef fish threatens sport diving, as well as the ecosystems supporting fishing. Despite these common ecological concerns, the threat of environmental degradation was not addressed. Distrust and miscommunication took the place of compromise and the implementation of an effective and mutually beneficial resource management program.

Recently, however, a local NGO, the *Soufriere Regional Development Foundation,* broke the deadlock between the competing groups. The Foundation was established in 1991 to promote economic security and self-sufficiency in the Soufriere region by using the area's natural and cultural resources to promote sustainable tourism. Like CANARI, the Foundation has been extremely successful in garnering strong grassroots support. One reason for this is the Foundation's belief that successful development projects will be initiated by locals, and must produce local benefits. The Foundation's mission of ensuring the provision of basic human needs, environmental quality, education, social harmony, recreation and cultural integrity also has broad-base appeal (Phinisterre, 1994).

In response to a declining coastal environment and conflict between resource users, the Foundation coordinated successful negotiations between yachters, fishermen, and divers. This was accomplished by seeking their collaborative involvement in discussions concerning the newly formed Soufriere Marine Management Area. These negotiations led to the to establishment of multiple-use management principles that for the first time would benefit *all* users by creating mutually acceptable guidelines for the use of coastal and marine resources. Both divers and fishermen gained exclusive use of certain marine areas, while moorings for yachts were planned to minimize the damage caused by anchoring (Phinesterre, 1994).

Today, cooperation between the groups has reached the point that if local divers notice a stray fish pot on a protected reef they can have it removed by simply phoning the Soufriere Fishermen's Cooperative. In turn, some divers now act on behalf of local fishermen by asking yachters to leave fishing sites. In a recent symbolic gesture, the head of the fishermen's

cooperative went to a protected area just offshore from a local dive shop and, along with a dive master, pulled a fish pot off the reef. He then threw back the reef fish and kept the food fish, promising that other fishermen would continue this practice in the future (Allard, 1994). This newfound sense of cooperation extends to the point that local dive boat captains volunteer to take water visibility and water quality measurements on each dive in order to collect baseline data on the health of coral reefs for CANARI's marine biologist.

The Soufriere Regional Development Foundation is also promoting local economic security to ensure that the short-term demands of poverty do not override the long-term concerns of environmental protection. Because of Soufriere's remote location and poor roads, an important step towards making the town more accessible was the construction of a dock by the Foundation's predecessor, the Soufriere Development Programme. Easier access has brought the town into St. Lucia's tourism mainstream. Today, the Foundation is involved in promoting local ownership of hotels, restaurants and shops, and is encouraging increased economic linkages between the tourist industry and local farmers, artists and fishermen. Other projects include developing tours of the region's Creole architecture, upgrading tourism facilities at the nearby Sulphur Springs and establishing a marine park and reserve.

V. St. Lucian Lessons for Progressive Policy Making

> "Among Eastern Caribbean nations, St. Lucia has been noteworthy in the establishment of planning and development control functions, enactment of environmental legislation, and the advancement of public and private initiatives promoting conservation. Yet a comprehensive national resource management program does not exist, and there is growing concern that coastal and marine resources, in particular, are at risk from human activity associated with development efforts" (CCA/IRF, 1991: 144).

Components of Progressive Institutional Mechanisms

Despite the barriers to coastal management outlined in Section III, the successes of USAID, CANARI, the St. Lucia National Trust, and the Soufriere Regional Development Foundation suggest that sustainable development in St. Lucia is attainable. Moreover, insights gained by studying common elements of their most effective programs can serve as a guidelines for developing institutional mechanisms designed to promote future development efforts in small island states. Many of these insights center around the ideas of "co-management" espoused by CANARI and the Soufriere Regional Development Foundation.

This "grassroots" style of development is based on three interdependent premises (Renard 1991; Renard, 1992; Smith and Berkes, 1993; Cumberbatch, 1993; Cumberbatch, 1994a).

*First, *successful regional development programs must have strong support from local communities.* Although they may be initiated by outside organizations, these programs should eventually be entrusted to local leadership and local institutions.

*Second, because environmental sustainability and economic security are linked (Alleyene, 1993; Simmons 1993), *development initiatives should include community management systems that provide incentives to conserve the local resource base via cooperation, shared authority and responsibility*; rather than relying solely on government regulation.

*Third, environmental degradation is often the result of poverty, which forces

overexploitation. Therefore, *development policies should promote economic security by strengthening and diversifying local economies in order to provide alternatives to unsustainable resource use.*

In addition to these three goals, successful coastal management programs share two other common denominators: they have greatly benefited from the expertise and *support of regional and international NGOs and development agencies*, and have *actively pursued collaboration with other groups pursuing sustainable development.*

The Continued Need for Environmental Education

In St. Lucia, as in other small Caribbean islands, there remains a pressing need for environmental education that reaches all segments of society. Fortunately, a strong educational foundation has already been created by the efforts of NGOs like RARE and CANARI, as well as government agencies like the Saint Lucia National Trust and the Forest and Lands Department.

Conservation efforts in St. Lucia have benefited from traditions of involvement by actively promoting environmental awareness as a means of creating support for, and involvement in, local conservation programs. The environmental group RARE, for example, publicized the habitat loss threatening the national bird, the Saint Lucian parrot, with posters, billboards, radio spots, buttons, and a music video. Additionally, RARE staff members, often wearing an elaborate Saint Lucian parrot costume, gave educational presentations to every grade school class on the island (Butler, 1994).

The Saint Lucia National Trust has also been very successful in promoting environmental education. It publishes newsletters, runs summer learning camps for both grade schoolers and older students, sponsors art shows with environmental themes, and organizes a speaking series that features talks by naturalists. The Trust also publicized the Plan for the System of Protected Areas in radio programs, describing the Plan and encouraging listeners to call in with suggestions. An informational video was produced and broadcast on local television stations, and a number of news releases were printed in local papers. Community input was encouraged by a series of approximately 20 public meetings and planning workshops. The workshops were designed to provide an accurate representation of the entire public's views on, and expectations of, the Plan. Consequently, they included community leaders, fishermen, farmers, churches, mothers clubs, youth and sports clubs, educators, unions, sand miners, and representatives of the tourism industry and squatters settlements (SLNT, 1994).

CANARI's environmental education efforts include support of nature centers, education of local resource users, and the involvement of school groups in collection of baseline data. The Forest and Lands Department produces newspaper columns, creates educational materials for schoolchildren, runs an environmental education bus that tours the country, and manages a zoo, classroom and nature trail at the Department's headquarters.

Most environmental education programs in St. Lucia successfully stress the intrinsic value of nature by fostering a deeper understanding and appreciation of the beauty and complexity of the island's natural environment. These programs emphasize the importance of conservation as a means of promoting national pride and protecting natural beauty. A few organizations (CANARI and the Soufriere Regional Development Foundation) have managed to transform this growing

environmental awareness into concrete action by emphasizing the links between improving standards of living and environmental protection. Because of their success, increasing numbers of St. Lucians now realize that the island's economy is vulnerable to degradation of the natural resources supporting agriculture and loss of the natural beauty attracting tourists.

St. Lucia's economic security is largely dependant on the natural resources supporting agriculture and tourism, while economic diversification into industries such as light manufacturing and offshore finance have been largely ineffective. Consequently, educational programs should strengthen efforts to foster progressive linkages between environmental conservation, economic security, and self-comanaged activities.

The Need for Local Support

To be successful over the long run, coastal development programs must have strong *support from local communities*, and must *link environmental conservation with economic security*. Unless local support for sustainable development initiatives exists and is harnessed by effective management programs, a combination of inadequate environmental legislation and spotty enforcement will lead to environmental decline associated with a "tragedy of the commons". Local support for sustainable development initiatives can be drawn from the island's long history of community involvement. Traditionally, local women played a central role in consciousness-raising, maintaining community commitment, raising money and mobilizing local resources. Throughout rural St. Lucia, women have taken the lead in the organization of Mothers & Fathers Groups, and initiatives involving church/chapel congregations appear to garner strong and lasting community support (Lionel and Jules, 1987; Trist, 1987).

Given traditions of local involvement and the promotion of environmental awareness by developmental groups, it is not surprising that high school students, charcoal cutters, dive boat captains, and fishermen volunteer to collect baseline environmental data. It is also not surprising that this involvement, in combination with co-management initiatives actively seeking local input, results in increased local commitment to environmental conservation initiatives. The effects of this commitment are clear: in areas where CANARI is actively organizing local communities on the basis of "co-management" principles, resource users have begun to associate responsible resource use with improved living standards and economic security. As a direct result, wildlife habitat is being preserved and sea urchin stocks and mangrove forests are recovering from over harvesting. In regions where the only environmental protection is the unlikely threat of prosecution, recovery has not occurred, and degradation is continuing apace.

Environmental degradation threatens those who rely on local resources more than any other group. Because resource users are responsible for at least some of the degradation threatening their livelihoods, their support is essential, and once won, this support is an extremely effective means of halting ecological decline. Fishermen, farmers, charcoal cutters, dive masters, and tour guides gain the most from local development initiatives that are ecologically sustainable, and show strong support for them. Coastal conservation programs failing to address their needs are inappropriate, and, in all likelihood, will fail.

The Need for External Aid

Although local commitment to sustainable development initiatives is necessary, it is not

sufficient. The *support and leadership provided by national, regional, and international developmental agencies is also essential*, playing a key role in raising environmental awareness and in organizing and supporting local developmental efforts. These outside groups serve as catalysts for local coastal conservation efforts by providing expertise, training, technical assistance, leadership, and funding.

Although an essential component of environmental protection efforts in St. Lucia, external support is often project-oriented and short-term, while the processes creating environmental decline are complex and can only be solved with long-term efforts. When development programs are "started as externally funded projects, they are vulnerable to interruption by discontinued funding and the availability of outside expertise" (Smith, 1994a: 67). Because of this limitation, externally funded and organized programs should be designed to mesh with community goals. The role of external agencies should be one of initiating and supporting programs that address local needs, encourage local participation, and, eventually, can be directed by local leaders when outside donors pull out. External aid can be seen as "seed money" invested in initiatives that can eventually become self-supporting.

The other option is that external organizations can make a long-term commitment to specific regions. CANARI, for example, with the philosophy that "development is a process, not a project", has done so in the southern coast of St. Lucia. Here, local programs addressing environmental conservation and community development along the South East Coast are largely inspired by and based on CANARI's regional, forward-looking agenda which advocates co-management of information access, data-base development, expert-opinion constancy, educational program organization, and workshop co-ordination (Cumberbatch, 1994a). The successful intermediation of CANARI outsider experts/facilitators via person-to-person interactions is extremely effective. The need for a culturally-sensitive outsider with the persona to gain the confidence of insiders, ensures the maintenance of the project's inter-connected, development and environmental objectives. The local-NGO facilitator is thereby able to negotiate for the coalescence of national and local objectives, be an ombudsman as well as a friend, and see the project through to conclusion as her/his institution's demonstration of commitment to match the local-community's staying power and commitment to the project.

The Need for Collaboration

In addition to the need for local support and outside assistance, the St. Lucian experience suggests that successful coastal protection efforts are the result of *collaboration* between international, regional, national and local organizations. This cooperation is achieved by focusing on *common needs and goals* and by promoting programs that benefit local communities, the nation, the region, and governments of international donors alike. The organizations outlined in Section IV seem to agree that economic security, environmental protection, community development, and quality of life are interlinked. Additionally, they share concerns over habitat loss, the effects of economic stagnation (or decline), and the legacy we leave for future generations. This consensus leads to similar concerns and goals, and can result in cooperative efforts which are more likely to produce effective results than development projects with local support. The political consensus they generate creates momentum and broad based support which is made all the more effective by a broader perspective, an increased pool of financial

support and expertise.

The successes of inter-organizational cooperation are apparent in the St. Lucia case. The most effective projects studied resulted from cooperation between communities, NGOs, government, and regional and international institutions. One example of the benefits of collaboration is St. Lucia's System of Protected Areas. Although this project was directed by the Saint Lucia National Trust, it was based on research originally funded by USAID (Hudson, Renard, and Romulus, 1992). The Plan was written by Leslie Hudson and Yves Renard of CANARI, who were working under the direction of an advisory committee established by the Trust. The 12-member advisory committee consisted of representatives of the Department of Forests and Lands, CANARI, the National Youth Council, the Hotel and Tourism Association, The St. Lucia National Trust, the Tourist Board, the private sector, and the Folk Research Center.

The organization and operation of the Saint Lucia National Trust is itself another good example of the benefits of collaboration and cooperation across all scales. Although a national organization, the Trust is pursuing a course of decentralization in which the autonomy of regional managers is encouraged and local input into conservation programs is highly valued. This local input is balanced by the creation of vertical linkages with CANARI, the Caribbean Conservation Association, USAID, SPIF, and CIDA--largely as the result of the energies and dynamism of successive directors and Council members as champions of environmental conservation: for example, the late Gabriel "Coco" Charles, (St. Lucia National Trust, 1993a).

The Need for Economic Security

In St. Lucia, successful projects grow from the seeds of local support, external aid, compromise, and a consensus based on the principles of sustainable development. In coastal localities where these components successfully mesh, local resource users have joined NGOs and government agencies to ensure that the natural resources supporting the economy are not degraded. Some highly degraded areas, such as the seagrass beds adjacent to the Maria Islands Nature Reserve as well as Laborie (a town where co-management practices are supported) are even beginning to recover, and areas formerly depleted of sea urchins are again yielding sustainable harvests (Smith and Berkes, 1991).

NGOs, development agencies, and local communities are being joined by progressive members of government and the tourism industry, who share their goal of conserving coastal areas as a means of ensuring economic security. Broad support for the System of Protected Areas and the large membership base of the National Trust indicate that there is a growing realization that St. Lucia's economic future is tied to tourism and agriculture. Sectors of the economy that are not intimately linked to environmental sustainability are stagnating, and many are realizing that the strength of future economic growth relies on the health of the island's environment (See Moore, 1989; Alleyne, 1993; Griffith 1993; Inniss and Griffith, 1993; Simmons, 1993).

Small May be Beautiful

St. Lucia's small size and insular nature seem to be one of the reasons some coastal protection efforts have been successful. Smallness encourages person-to-person interaction, as

government officials are generally accessible, the leaders and members of individual NGO's are generally well aquatinted (often serving on each other's boards), and local concerns are not smothered in layers of bureaucracy (Conway, 1991). This creates an atmosphere of heightened interaction encouraging discussion of common concerns and increasing the likelihood of cooperation and broad-based consensus. The island's small size also encourages participation in conservation programs: individuals working in small organizations on local problems are much more likely to see the immediate fruits of their labor. The same is true at the community level, where the efforts of a small group of leaders can produce rapid and dramatic benefits, and their successes encourages others to become involved.

St. Lucia's intimate scale also encourages an interdisciplinary, broad-based approach to environmental conservation projects: the folly of separating the dynamics of interior watersheds from beaches, mangroves, seagrass beds, and reefs is made clear by their close proximity.

Conclusion: A Cautionary Note

Despite the successful initiatives outlined in this paper, St. Lucia still faces a number of barriers to sustainable development initiatives. These problems include inadequate legislation and enforcement (co-management programs may reduce the need, but not eliminate it), a lack of a suitable national land use plan (the System of Protected Areas has not yet been approved, and only affects a limited number of sites), and a lack of adequate baseline environmental data (the publication of the *St. Lucia Environmental Profile* by the CCA and IRF is an important first step, and so are the efforts of many local resource users). Another concern is the dearth of local technical experts and managers caused by inadequate training programs and by "brain drain" (many of the most educated St. Lucians emigrate). This shortcoming is becoming increasingly important as international donors withdraw economic and technical support from the region.

However, most of St. Lucia's environmentalists still feel that the unbridled encouragement of mass tourism and its need for more large hotels is the most significant threat to the sustainable management of the island's coastal zones. Until recently, the government has been "hell-bent on pursuing a program of 'crash development' with Singapore as a developmental model," (paraphrasing Devaux, 1994). Indeed, the government has offered tax holidays for major hotel developments and has supported their construction, even at the expense of honoring previous commitments to protected coastal areas: e.g. the divesting of Savannes Bay from the St. Lucia National Trust (St. Lucia National Trust, 1993b).

There is a need for all involved communities -- people in the political arena, in the tourism, real-estate and land-development private sector, and in the local formal and informal economic sectors -- to become more aware of the gravity of environmental issues. The energies of local NGO members, the facilitation of international agency partnerships which our EPAT-MUCIA project seeks to mediate, and the quest for a sustainable future demands a (renewed) commitment and political will to support developmental and environmental goals among all involved. The lessons derived from "stake-holder, self-management" successes in St. Lucia should raise our hopes and our vision.

Bibliography

Allard, Michael (1994), manager of Scuba St. Lucia, personal interview.

Alleyne, Frank (1993) The impact of economic development upon the environment, *Bulletin of Eastern Caribbean Affairs*, 17(2&3): 55-59.

Barrow, Christene (1992) *Family Land and Development in St. Lucia*. Cave Hill, Barbados: Institute of Social and Economic Research.

Bossi, Richard and Cintron, Gilberto (1990) *Mangroves of the Wider Caribbean: Toward Sustainable Management.* Washington: The Panos Institute.

Butler, Paul (1994), director of conservation education, RARE, personal interview.

Butler, R.W. (1980), The concept of a tourist area cycle of evolution: Implications for Management of Resources, *Canadian Geographer*, 24(1): 5-12.

Caribbean Conservation Association, Island Resources Foundation (CCA/IRF) (1991) *Saint Lucia Environmental Profile*, St. Michael, Barbados: Caribbean Conservation Association.

Caribbean Law Institute (CLI) (1992), *The Environmental Laws of the Commonwealth Caribbean: Analysis and Needs Assessment.* Cave Hill, Barbados: Caribbean Law Institute.

Central Intelligence Agency (CIA) (1991), *World Factbook 1991*, Washington, D.C.: CIA.

Canadian International Development Agency (CIDA) (1988a), *Caribbean Environmental Programming Strategy, Final Report: Volume 1Executive Summary*, Ottawa: CIDA.

Canadian International Development Agency (CIDA) (1988b), *Caribbean Environmental Programming Strategy, Final Report: Volume 2 Strategy Plan*, Ottawa: CIDA.

Canadian International Development Agency (CIDA) (1988c), *Caribbean Environmental Programming Strategy, Final Report: Volume 3 Background Information*, Ottawa: CIDA.

Conway, Dennis (1991), Small may be beautiful, but is Caribbean development possible?, *UFSI Field Staff Reports*, Latin America, No. 13.

Cumberbatch, Janice (1993) "Reflections on Democracy in the Caribbean Co-management as an Instrument of Change." Paper presented at the Caribbean Studies Association Meeting, Kingston and Ocho Rios, Jamaica, May.

Cumberbatch, J. (1994a) "CANARI Assists Sustainability of the Caribbean," *Caribbean Contact*, 20(3): 19.

Cumberbatch, Janice. (1994b) Training Coordinator, CANARI. Personal Interview.

Deveaux, Robert (1994). Personal interview.

Goss, Benjamin and Dennis Conway (1992), 'Sustainable development and foreign direct investment in the Eastern Caribbean: A strategy for the 1990's and beyond?', *Bulletin of Latin American Research*, 11(3): 307-326.

Government of Saint Lucia (GOSL) (1986) *Annual Statistical Digest*. Castries, Saint Lucia: Government of Saint Lucia.

Government of Saint Lucia (GOSL) (1991) *Annual Statistical Digest*. Castries, Saint Lucia: Government of Saint Lucia.

Government of Saint Lucia (GOSL) (1991) *Saint Lucia Population and Housing Census 1991*. Castries, Saint Lucia: Government of Saint Lucia.

Griffith, Mark (1993) Perhaps our last chance to save the planet, *Bulletin of Eastern Caribbean Affairs*, 17(1&2): 26-42.

Harker, Trevor (1990) Sustained Development for the Caribbean, *CEPAL Review*, 41: 55-72.

Hudson, Brian J. (1986), 'Landscape as a resource for national development: A Caribbean view', *Geography*, 71(2): 116-121.

Hudson, Leslie, Renard, Yves, & Romulus, Giles (1992), *A system of protected areas for St. Lucia*. Castries: St. Lucia National Trust.

Inniss, Vernese and Griffith, Mark (1993) Environment diplomacy, *Bulletin of Eastern Caribbean Affairs*, 17(1&2): 43-54.

Latin America Bureau (LAB) (1987) *Green Gold: Bananas and Dependency in the Eastern Caribbean*. London: Latin America Bureau.

Lionel, Egbert and Jules, Didacus (1987) *A Survey of Groups and Organizations Involved in Rural Development Work in St. Lucia*, (Castries, St. Lucia: Caribbean Network for Integrated Rural Development [CNIRD], September).

McElroy, Jerome (1991), *The stages of tourist development in small Caribbean and Pacific islands*, paper presented at the International Symposium on the Island Economies: Policy Models for Planning Development, Lesbos, Greece.

McElroy, Jerome, and de Albuquerque, Klaus (1990), Managing small island sustainability: Towards a systems design, *Nature & Resources*, 26(2): 23-29.

McElroy, Jerome L. & de Albuquerque, Klaus (1990) 'Sustainable small-scale agriculture in small Caribbean islands', *Society and Natural Resources*, 3: 109-129.

McElroy, Jerome, and de Albuquerque, Klaus, and Towle, Edward (1987), Old problems and new directions for planning sustainable development in small islands, *Ekistics*, 323/324: 93-100.

McElroy, Jerome and de Albuquerque, Klaus (1991), 'Tourism styles and policy responses in the open economy-closed environment context', in Norman P. Givran and David Simmons, (eds.) *Caribbean Ecology and Economics*. CCA: St. Michael, Barbados.

Moore, Euna (1993) The importance of the environment to socio-economic development, *Bulletin of Eastern Caribbean Affairs*, 16(1): 29-34.

National Population Unit (1992) *Selected Socio-Economic Indicators-St. Lucia*, Ministry of Planning: Castries.

Organization of Eastern Caribbean States (OECS) (1993) *Environmental Monitoring in the Eastern Caribbean*, Environmental and Coastal Resources Project, OECS.

Phinesterre, P. (1994) personal interview.

Prasad, Uprety B. (1994) personal interview.

Price Waterhouse (1994) *Doing Business in St. Lucia* (Supplement to 1992 Information Guide), Price Waterhouse World Firm Services: Castries.

Renard, Yves (1991) Institutional challenges for community based management in the Caribbean, *Nature and Resources*, 27(4): 4-9.

Renard, Yves (1992) *Popular participation and community responsibility in natural resource management: A case from St. Lucia, West Indies,* Caribbean Natural Resources Institute: Vieux Fort.

Renard, Yves 1994. Personal interview.

Saint Lucia National Trust (SLNT) (1994) *Annual Report for the Period April 1, 1993 - March 31, 1994,* Saint Lucia National Trust: Castires.

Simmons, David (1993) Environment and economic development in the Eastern Caribbean, *Bulletin of Eastern Caribbean Affairs*, 17(1&2): 68-75.

Smith, Allan H. (1986) *A Guide to Seamoss Cultivation in the West Indies.* Barbados: Letchworth Press.

Smith, Allan H. (1992), Summary of the activities of the Caribbean Natural Resources Institute in relation to integrated development in Coastal areas, *Out of The Shell,* 3(1): 20-22.

Smith, Allen H. (1994), 'Community involvement in coral reef monitoring for management of the insular Caribbean' in Alan T. White, Lynne Zeitlin Hale, Yves Renard, Lafcadio Cortesi (eds.) *Collaborative and Community-Based Management of Coral Reefs: Lessons From Experience*. Kumarian Press: West Hartford Connecticut.

Smith, Allan H. & Berkes, Fikret (1991) 'Solutions to the 'tragedy of the commons': sea-urchin management in St. Lucia, West Indies', *Environmental Conservation*, 18(2): 131-136.

Smith, Allan H. & Berkes, Fikret (1993), 'Community based use of mangrove resources in St. Lucia', *International Journal of Environmental Studies*, 43: 123-131.

Stone, Roger D. (1988) 'Conservation and Development in St. Lucia', *World Wildlife Fund Letter*, No. 3.

Trist, Carolyn Rachel (1987) *Participatory Approaches to Development in Saint Lucia, West Indies: Learning Processes, Innovation and Collaboration in an Emergent National model.* Unpublished MA thesis: University of Pennsylvania, Philadelphia).

United Nations Industrial Development Organization (UNIDO) 1987, *Industrial Development Review Series: The Caribbean Region*. United Nations: New York.

USAID (1994), *Strategies for sustainable development*, Washington, D.C.: U. S. Agency for International Development.

World Bank (1993) *Caribbean Region Current Economic Situation: Regional Issues and Capital Flows, 1992*. The World Bank: Washington, D.C.

Table 1. Direct Threats to Saint Lucia's Coastal Environment

Threat	Cause	Effects
Resort Development	Growth of beach oriented, high-density, high impact tourism sector	Crowding, habitat destruction,
Destruction of Wetlands/Mangroves	Sites for landfills/dumps, charcoal production	Habitat destruction, degradation of resource base, esthetic disaster
Destruction of Seagrass Beds	Sedimentation, Biocides, recreational boating	Habitat destruction, declining numbers of fish, black sea urchins, and turtles
Degradation of Coral Reefs	Overfishing, sport diving, pesticides, eutrophication, coral collection	Habitat destruction, loss of fisheries and sport diving revenue
Sand Mining	Sand used as an aggregate in the production of cement and masonry	Beach loss, increasing vulnerability to natural hazards, declining property values
Depletion of Fisheries	Overfishing, poor management	Average marine catch has declined 1.3% per year in St. Lucia during the 1980's (World Bank 1993)
Municipal and Industrial Pollution	Discharge of municipal sewage, waste, operational and accidental releases of oil, dredging	Increasing water-borne disease (typhoid, gastro-enteritis) (World Bank 1993); Damage to marine communities
Agricultural Run-off	Misuse and overapplication of highly subsidized pesticides and fertilizers	Pollutes groundwater and sea water. Harmful to human health and marine life
Deforestation in Watersheds	Conversion of forests to agricultural uses; inadequate property rights/tenure insecurity farmers, unsustainable logging practices	Flooding of coastal lowlands, siltation, increase in suspended sediments that limit photosynthesis of coral reefs

TABLE 2

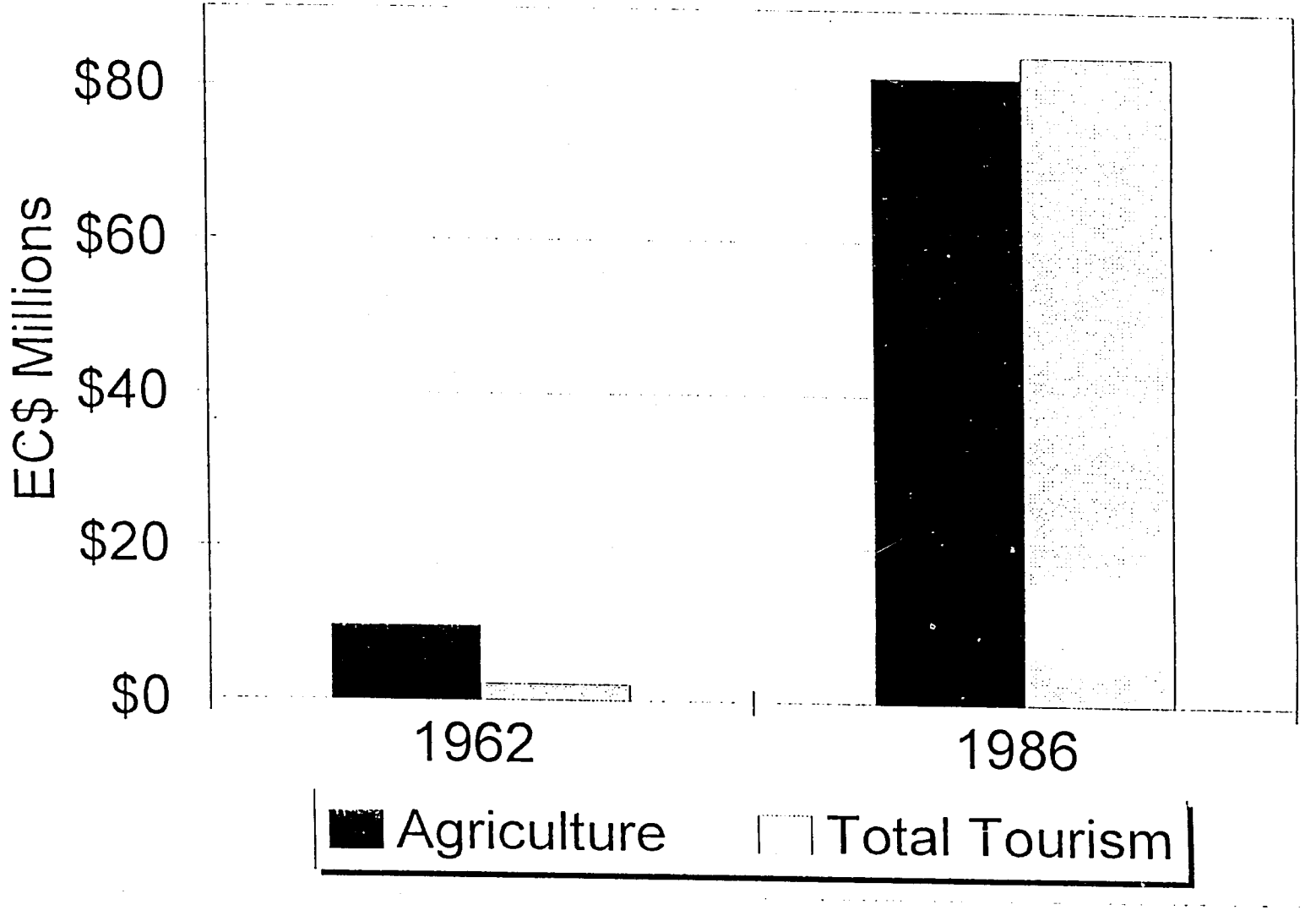
Legislation with a Bearing on Management of Coastal Resources in St. Lucia

Water and Sewage Authority Act (1984)	"Grants broad powers to the Water and Sewage Authority (Ministry of Health) for water conservation and protection of watersheds, and for preparing, constructing, operating and maintaining sewage disposal facilities throughout the country." **Inadequacies: does not provide for watershed protection or ownership and exploitation rights for water. Sewage is generally discharged into the sea without treatment; typhoid outbreaks have been linked to freshwater pollution by sewage; sedimentation caused by deforestation in watersheds seriously threatens nearshore marine ecosystems; a regulatory framework to implement this act is lacking, and enforcement capability is weak.*
Pesticides Control Act (1975)	"Establishes a pesticide control board to prepare and enforce regulations to control use of pesticides, including excessive application or accidental spills which can result in pesticide absorption by marine organisms in coastal habitats (if the chemicals are carried by streams or rivers to the sea)." **Fish kills have been linked to pesticides and fungicides; eutrophication of coral reefs (caused by agricultural fertilizers) is likely to be taking place; monitoring efforts are insufficient to outline the full extent of the problem; there are no regulations to ensure effective implementation.*
Tourist Industry Development Act (1981)	"Establishes a tourist board with powers to promote and develop tourism including coastal amenities that may attract tourists."
Parks and Beaches Commission Act (1983)	"Establishes as parks and beaches commission overseen by the Ministry of Tourism to maintain facilities in public parks, gardens, and beaches for tourism; the commission may also advise the Minister on matters relating to coastal erosion."
Beach Protection Act (1967)	"Assigns responsibility for controlling sand mining to the Ministry of Communications and Works and provides penalties for offenders." **Sand mining persists on beaches that are showing clear signs of increasing instability caused by overexploitation.*
Fisheries Act (1984)	"Provides for creation of marine reserves, fishing priority areas, aquaculture sites, and regulations for fisheries management; recently approved regulations include protection for sea turtles, minimum size limits for spiny lobsters (95 mm carapace length) and conch (1,000 g total weight); closed season for lobster, and licensing requirements for harvesting sea eggs, corals and sponges." **Despite the dearth of information on maximum sustainable yields, it appears that some species (sea eggs, spiny lobster, and conch) are being overharvested*

Source: CCA IRF, 1991: 150, CIDA, 1988c

St. Lucia's Shifting Economic Base

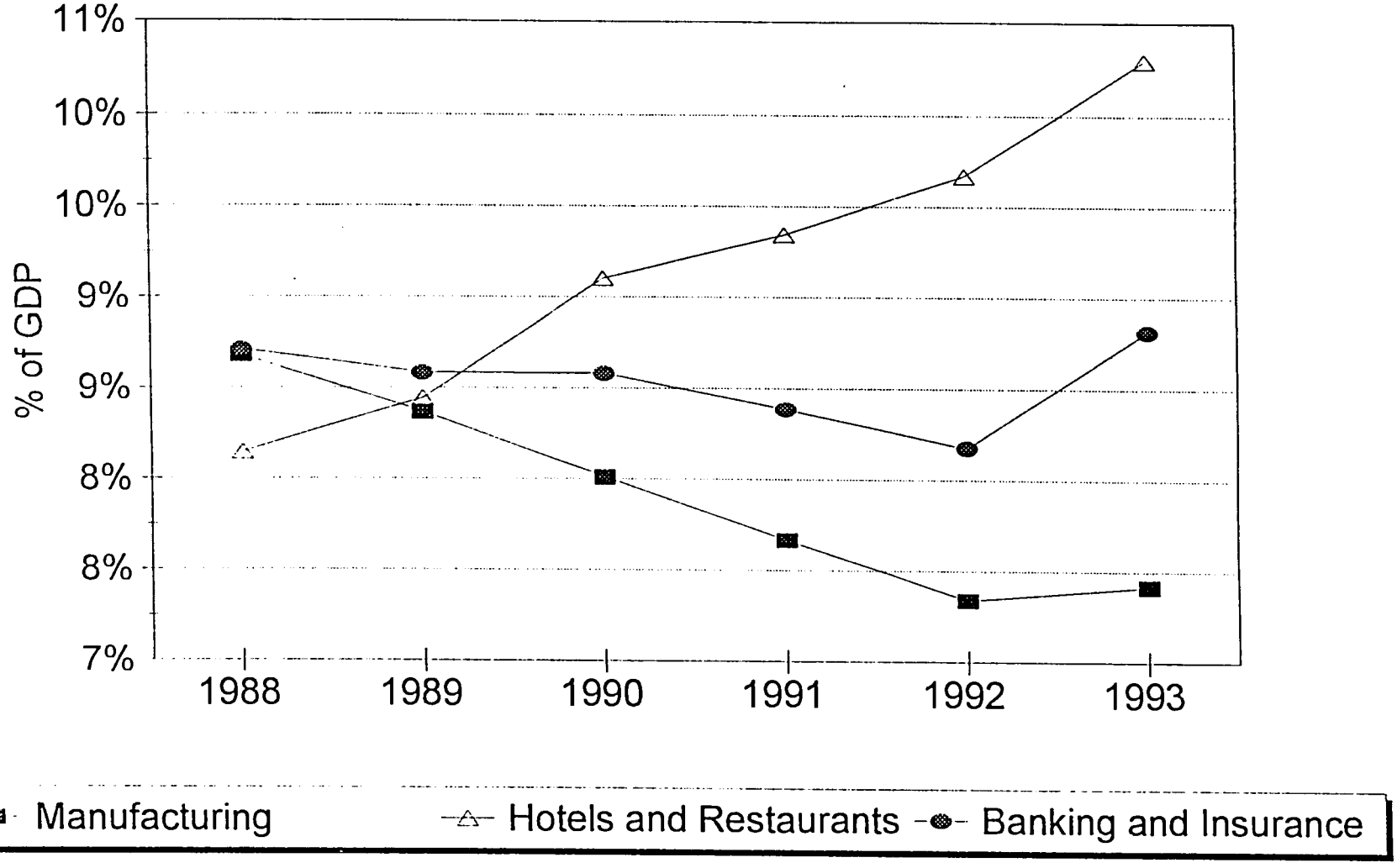
Economic Production: 1962 & 1986



Source: CCA (1991), based on GOSL (1986) and Bryden (1963).

Contribution to GDP by Sector

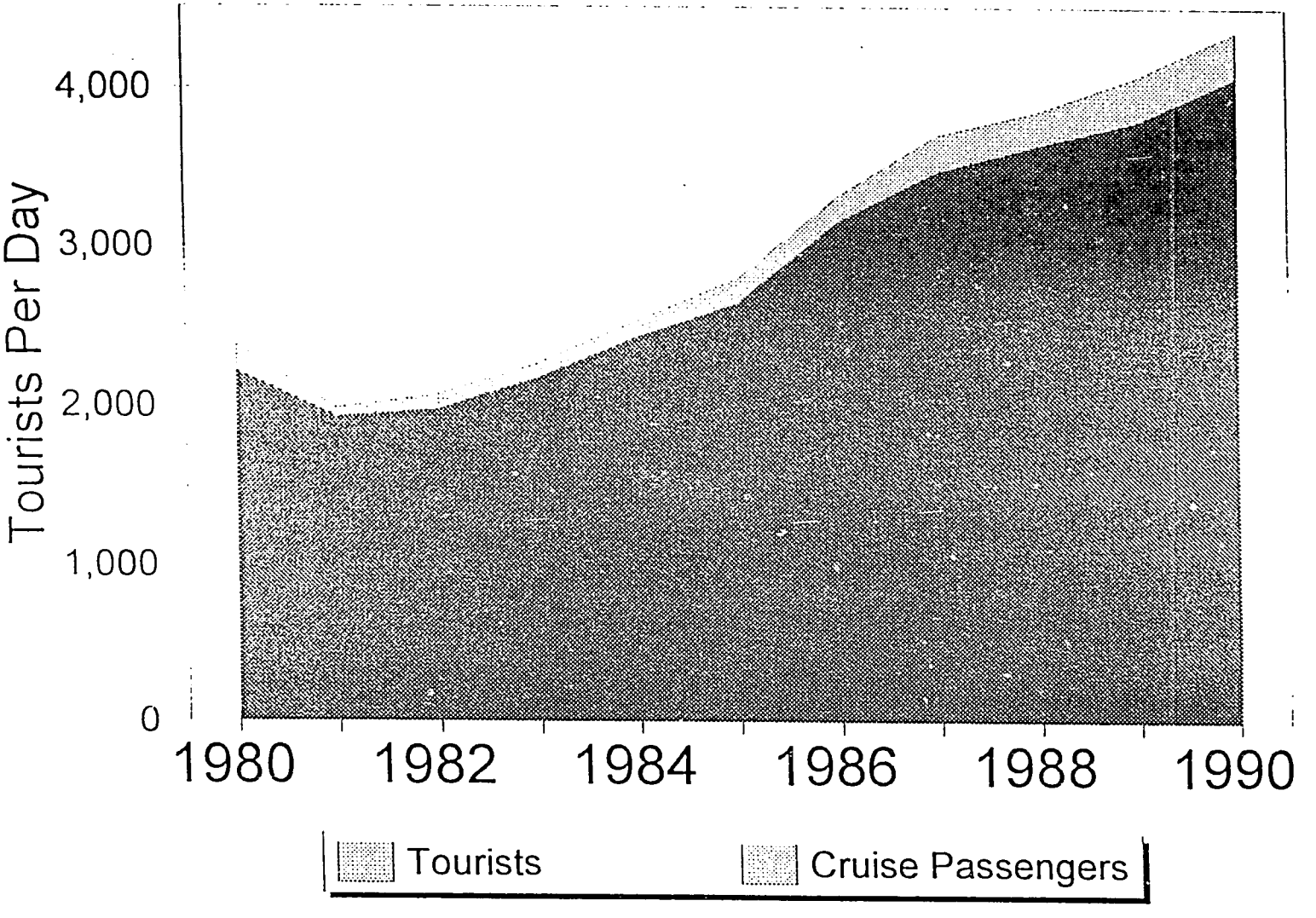
St. Lucia 1988-93



Source: Price Waterhouse, 1994

Increasing Numbers of Tourists

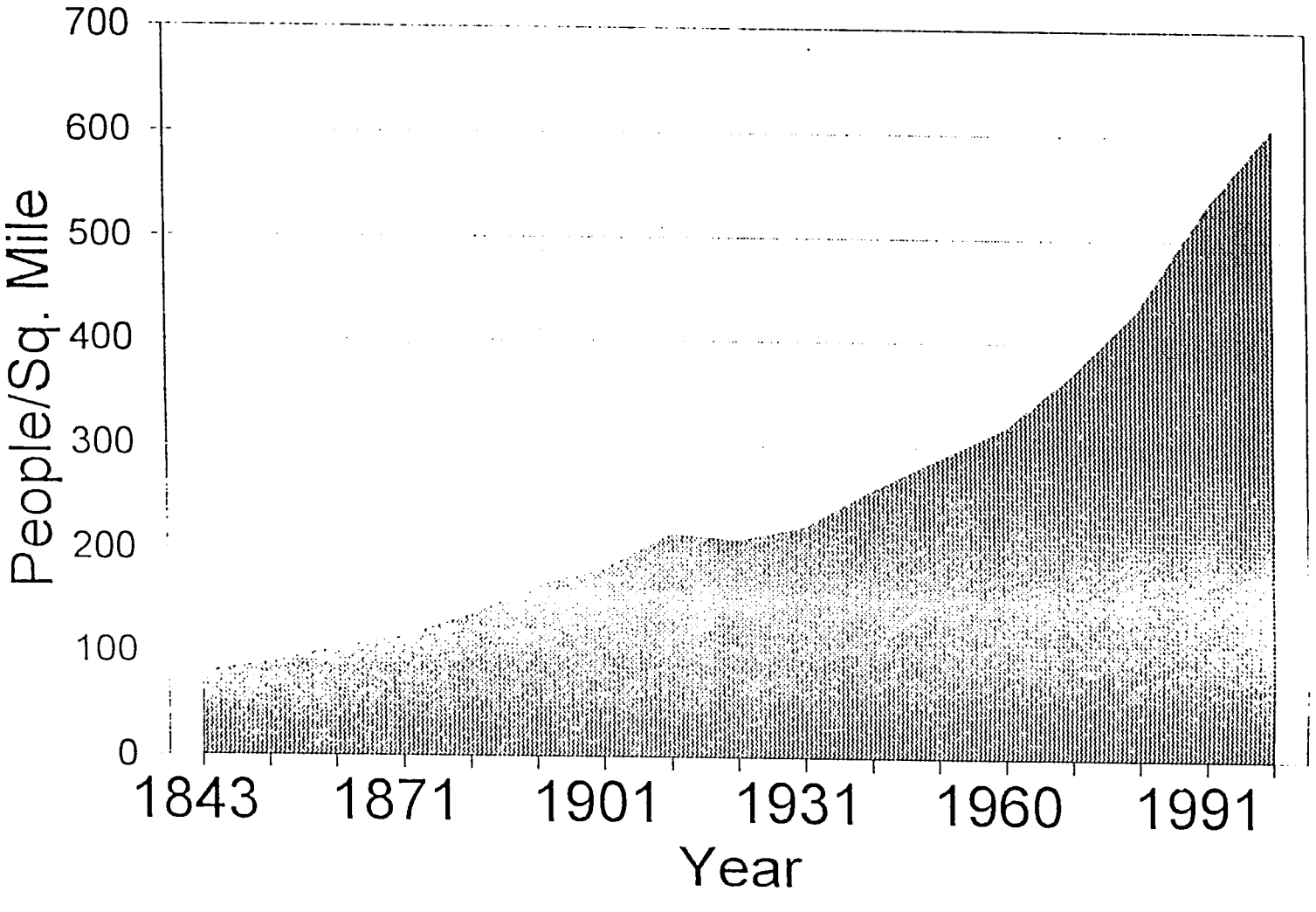
Saint Lucia 1980-1990



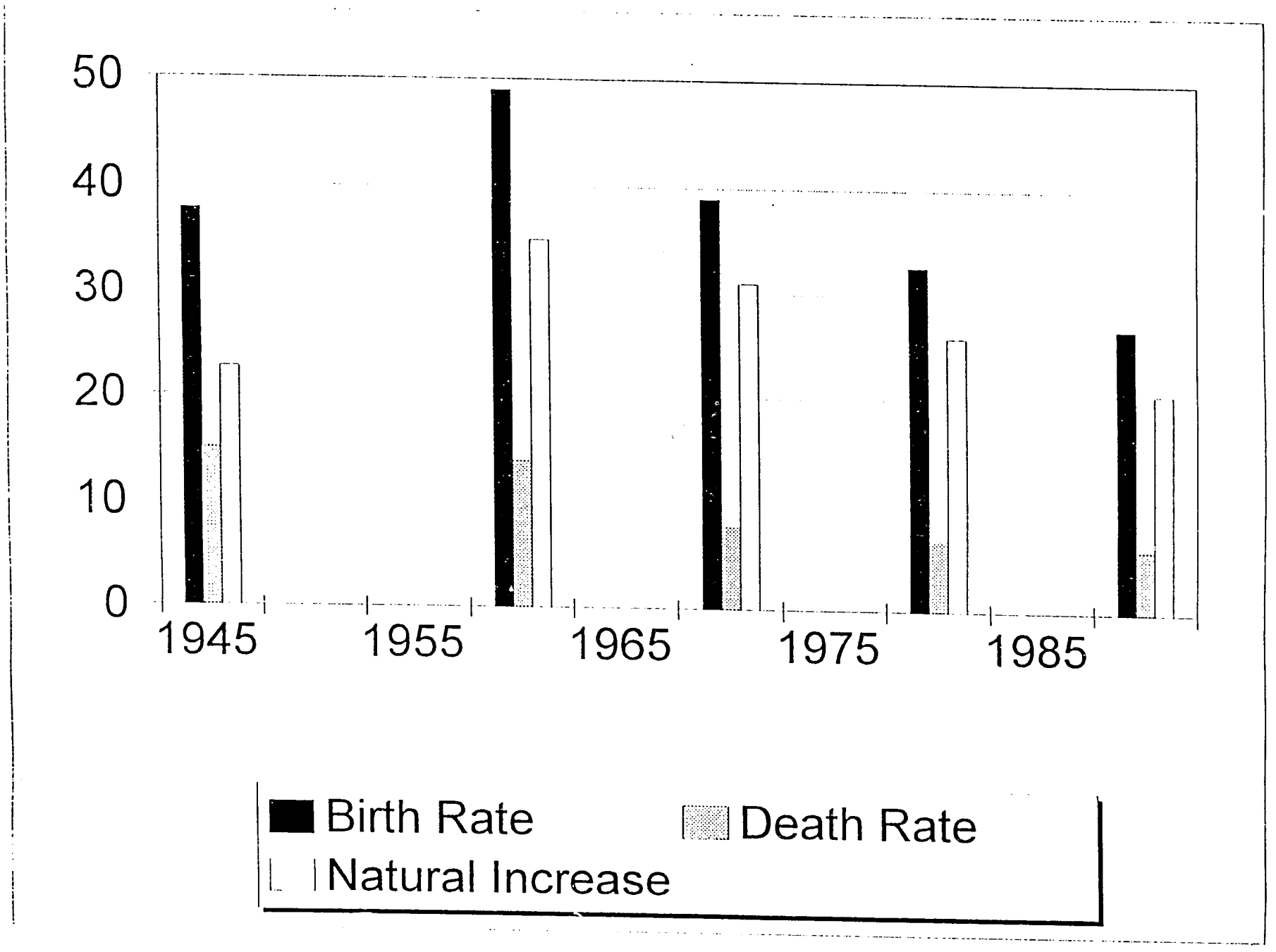
Source: CCA/IRF, 1991

St. Lucia Population Density

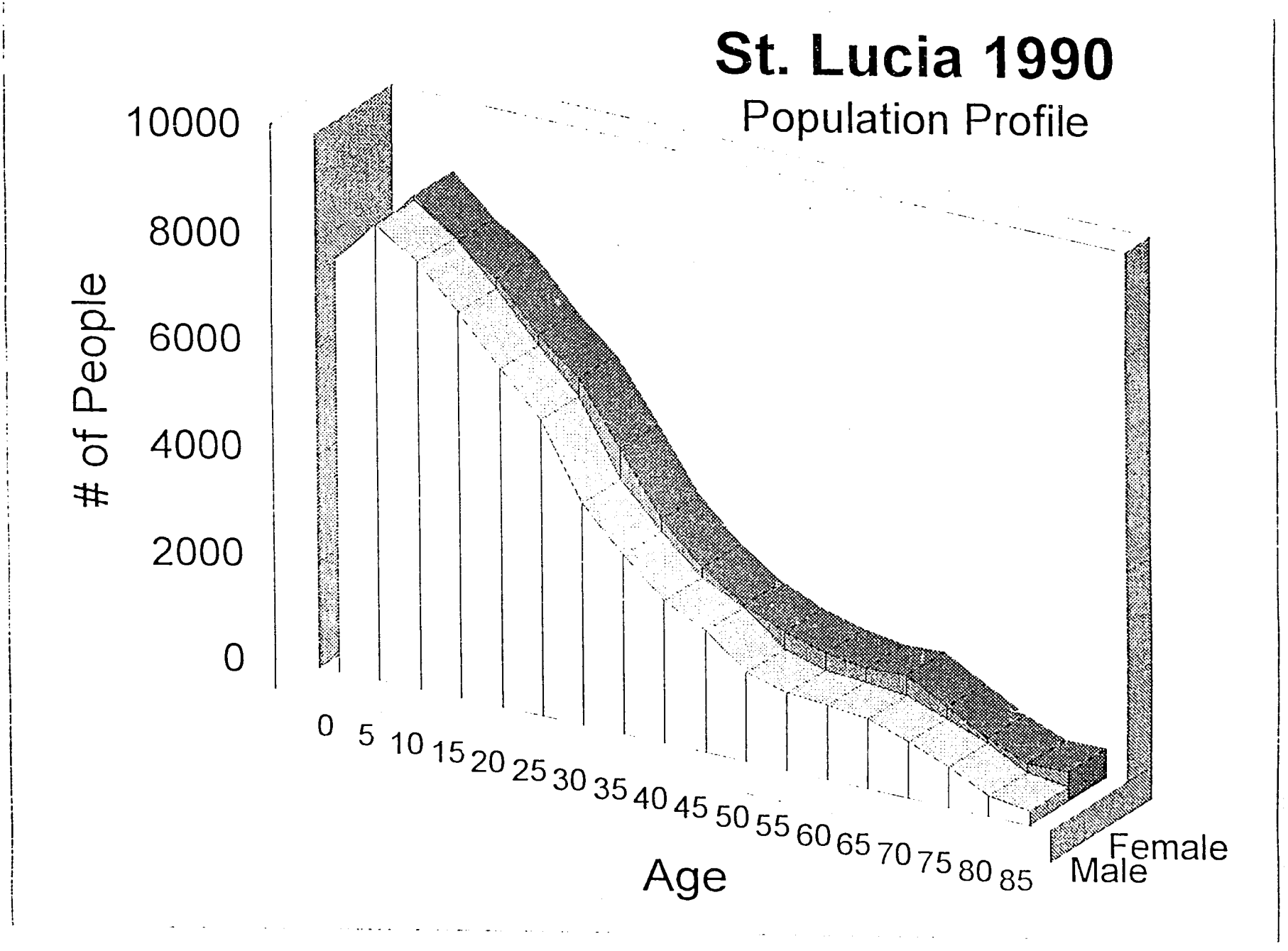
1843-1991



Source: National Population Unit, 1992



Source: National Population Unit, 1992



Source: National Population Unit, 1992