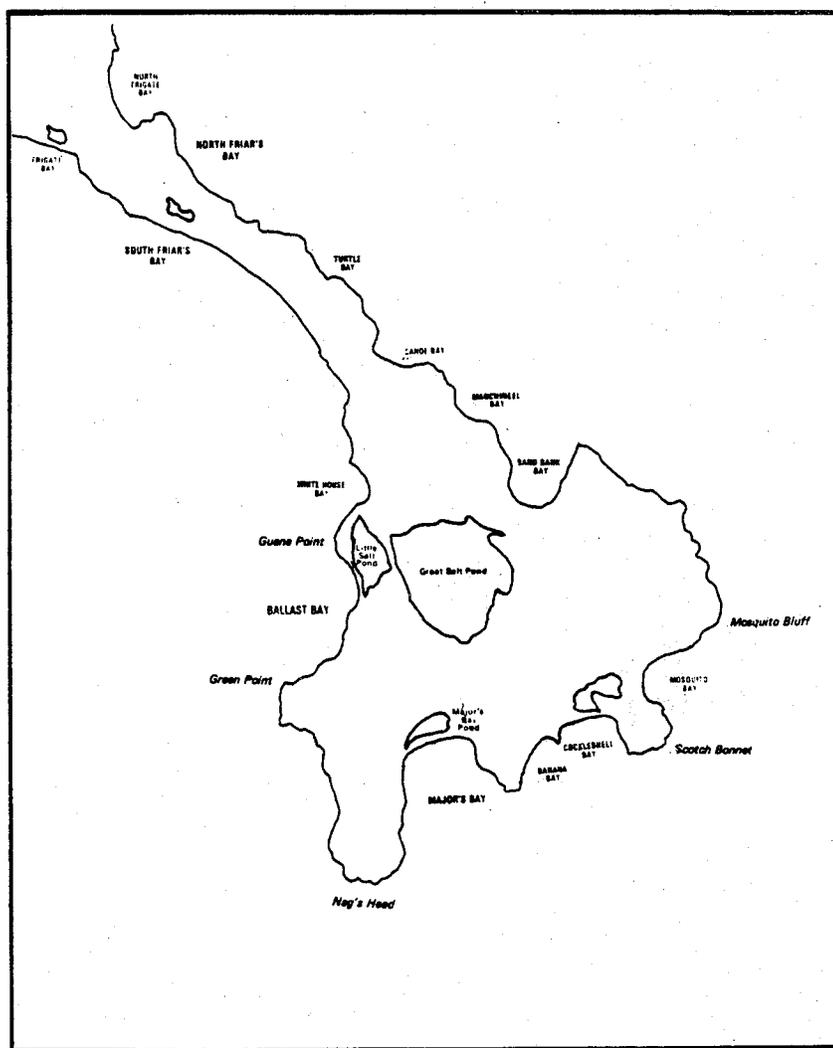


# Land Use Management Plan



PREPARED FOR: GOVERNMENT OF ST. KITTS AND NEVIS

PREPARED BY : ISLAND RESOURCES FOUNDATION

JUNE 1986

# ISLAND RESOURCES FOUNDATION

## *Caribbean Headquarters*

RED HOOK BOX 33, ST. THOMAS  
U.S. VIRGIN ISLANDS 00802  
(809) 775-6225

## *Washington, D.C. Office*

1718 P STREET, N.W., SUITE T4  
WASHINGTON, D.C. 20036  
(202) 265-9712

## LAND USE MANAGEMENT PLAN

FOR THE SOUTHEAST PENINSULA  
ST. KITTS, WEST INDIES

(July 1986)

Prepared For  
The Government of St. Kitts and Nevis

Prepared By  
The Island Resources Foundation  
St. Thomas, U.S. Virgin Islands

Edward L. Towle, Ph.D.  
Team Leader

With Funding Support From  
U.S. Agency for International Development  
Regional Development Office/Caribbean  
Bridgetown, Barbados

### Team Members:

Ivor Jackson, M.A.  
Barbara J. Lausche, J.D.  
N.J.O. Liverpool, LL.B., Ph.D.  
Jerome L. McElroy, Ph.D.

Bruce G. Potter, B.A.  
Luis A. Torres, B.A.  
Judith A. Towle, MPA  
Werner Wernicke, M.S.

## TABLE OF CONTENTS

### ACRONYMS AND ABBREVIATIONS

### EXECUTIVE SUMMARY

		<u>Page</u>
Section 1.	INTRODUCTION	
	1.1 Project Background	1-1
	1.2 Issues and Scope of Work	1-1
	1.3 Terms of Reference	1-2
	1.4 Operational Factors	1-3
	1.5 Conclusion	1-3
Section 2.	BACKGROUND ... AND FOREGROUND	
	2.1 The Place: Southeast Peninsula Landscape Features	2-1
	2.2 The Problem: What Is Land Use Planning?	2-2
	2.3 The Procedures: Management Alternatives	2-3
	2.4 The Programme: Toward a Strategy	2-4
	2.5 The Plan	2-6
Section 3.	LAND USE	
	3.1 The Land Classification Framework	3-1
	3.2 Development Zones	3-10
	3.3 Conservation Zones	3-19
	3.4 Access Road Landscaping and Lookouts	3-23
	3.5 Demand and Design Factors	3-24
	3.6 Recreation Uses	3-26
Section 4.	SUMMARY OF ECONOMIC CONSIDERATIONS	
	4.1 Socio-Economic Setting	4-1
	4.2 Constraints/Assumptions	4-2
	4.3 Findings	4-5
Section 5.	THE LAND USE MANAGEMENT FRAMEWORK: LEGAL AND INSTITUTIONAL ELEMENTS	
	5.1 The Dimensions of the Task	5-1
	5.2 Proposed Institutional Framework	5-1
	5.3 Time Line for Implementation of Institutional Requirements and Legislative Changes	5-3
Section 6.	DEVELOPMENT PLANNING CONTROLS AND GUIDELINES	
	6.1 Making the Development Process Work	6-1
	6.2 Control and Guidance	6-1
	6.3 Special Guidelines: The Amenities Agenda	6-2

REFERENCES

LIST OF CONTACTS

MEMBERS OF THE PROJECT TEAM

APPENDICES AND GUIDELINES:

- A Southeast Peninsula Development: Economic Projections
- B Regulatory and Management Considerations:  
The Institutional Framework
- C Planning and Environmental Protection Issues Related to the  
Southeast Peninsula: Legislative Considerations
- D Utilities and Roads
- E Sewage Disposal
- F Solid Waste Disposal
- G Controlling Impacts of Spearfishing and Marine Specimen  
Collecting Activities
- H Salt Ponds and Marinas
- I Marketing Factors
- J Environmental Impact Assessment
- K Beach Area Management Considerations
- L The "Southeast Peninsula National Park" Concept
- M Guidelines for Erosion and Sediment Control
- N Peninsula Trail System

LIST OF FIGURES  
(Sections 1-6)

	<u>Page</u>
3.1 Slope map of the Southeast Peninsula.	3-3
3.2 Southeast Peninsula soil map.	3-4
3.3 Recreation map of the Southeast Peninsula.	3-27
4.1 Comparison of labour force growth and tourism job projections over a 20 year period.	4-2
4.2 Cumulative tax receipts and road/water costs associated with Southeast Peninsula development.	4-6
5.1 Proposed institutional framework for Government of St. Kitts and Nevis to carry out regulatory and management functions relative to the development of the Southeast Peninsula.	5-2
5.2 Procedures for submission and review of development applications and for issuing of land use permits for Southeast Peninsula development projects.	5-5
Land Use Maps, Southeast Peninsula	[in 4 sheets 24" x 36" 1:5000 scale, folded, attached in envelope]

LIST OF TABLES  
(Sections 1-6)

3.1 Land slope factors and development options.	3-5
3.2 Characteristics of St. Kitts, Southeast Peninsula soil mapping units.	3-6
3.3 Criteria for determination of development zones.	3-7
3.4 Permitted land use by development zones.	3-11
3.5 Maximum allowable densities for hotels/condominiums and residences.	3-13
3.6 Intensive use zones: land use options.	3-15
5.1 Action agenda for implementation of Southeast Peninsula institutional requirements and legislative changes.	5-7

## ACRONYMS

AG	Attorney General's Office
AID	Agency for International Development (U.S.)
CIDA	Canadian International Development Agency
EAR	Environmental Assessment Report
EC	Eastern Caribbean (currency)
ECNAMP	Eastern Caribbean Natural Area Management Programme
EIA	Environmental Impact Assessment
EMU	Environmental Management Unit
ESC	Erosion and Sediment Control [Plan]
FBDC	Frigate Bay Development Corporation
GSKN	Government of St. Kitts and Nevis
IRF	Island Resources Foundation
IUCN	International Union for the Conservation of Nature and Natural Resources
IUZ	Intensive Use Zone
LUMP	Land Use Management Plan
LUZ	Limited Use Zone
MUZ	Moderate Use Zone
NGO	Non-Government Organisation
OAS	Organisation of American States
OECS	Organisation of Eastern Caribbean States
SEP	Southeast Peninsula
SEPPRA	"Southeast Peninsula Parks and Recreation Authority"
USAID	United States Agency for International Development
USAID/RDO/C	U.S. Agency for International Development/Regional Development Office/Caribbean

## ABBREVIATIONS

hwm	high water mark
gpd	gallons per day
kg	kilogram
km	kilometer
kva	kilo volt amps
kwh	kilowatt hours
m	meter
mgd	million gallons per day
mhw	mean high water
mva	million volt amps
mw	megawatts
\$mm	millions of dollars

# ISLAND RESOURCES FOUNDATION

## *Caribbean Headquarters*

RED HOOK BOX 33, ST. THOMAS  
U.S. VIRGIN ISLANDS 00802  
(809) 775-6225

## *Washington, D.C. Office*

1718 P STREET, N.W., SUITE T4  
WASHINGTON, D.C. 20036  
(202) 265-9712

## LAND USE MANAGEMENT PLAN FOR THE SOUTHEAST PENINSULA OF ST. KITTS

### Executive Summary\* (July 1986)

... merging tourism and conservation effectively is a tricky task, but one which may prove necessary for the survival of both (Stockly, 1984).

#### INTRODUCTION: THE DIMENSIONS OF THE TASK

The opening of the Southeast Peninsula for development activities will result in a formidable set of new or expanded planning, management, and regulatory responsibilities for the Government of St. Kitts and Nevis. The Frigate Bay experience pales by comparison and should not be allowed to induce a false sense of confidence about or an under-estimation of either the dimensions or the complexity of the new SEP venture.

Not only is the Peninsula four times larger in area, it involves much higher, steeper, erosion-prone rocky hillsides and eleven less stable sandy beaches; includes approximately a dozen major landholders with strong development preferences of their own; and has the lowest rainfall, the highest dunes, the largest salt pond and the greatest potential as an undeveloped area in the State. Furthermore, time is of the essence as the simultaneous social and economic pressures of declining sugar prices, under-employment and foreign exchange deficits have all been felt at the national level.

---

\*Note to the Reader: This Executive Summary is an action agenda of the St. Kitts Southeast Peninsula Land Use Management Plan, not a comprehensive review of textual material or findings, issues or even the Land Use Plan itself. With one or two exceptions, it focuses primarily on legal, administrative, staffing, planning and policy decisions that must be addressed in the immediate future by GSKN with reference to the Peninsula. A convenient sequencing matrix of required action, which covers most of the items in the Executive Summary, can be found in Table 5.1 on page 5-7/8 of the Land Use Management Plan.

In short, Peninsula development rests on the interdependency of public/private sector interests, with the role of each now somewhat loosely defined (e.g., Government: infrastructure and public services, environmental protection and regulation; private sector: investment, promotion, marketing). The terms of this "collective action bargain," however, are ill-defined and perhaps this Land Use Management Plan can serve as one means for arriving at a mutually acceptable agreement on a development strategy for the Peninsula.

For it to do so, however, it must be discussed by all interested parties, and each agenda item listed assigned a priority and a person, organisation, or specific group to carry out the required tasks, with specified target dates for completion. A full time administrative coordinator is urgently needed soon for all the myriad tasks and sub-tasks to be accomplished in an expeditious and effective fashion.

#### KEY FINDINGS

- Economic Viability (See Section 4 and Appendix A)

A sustainable tourism development scenario for the Southeast Peninsula must simultaneously satisfy five major criteria. Economic activity must be sufficiently rapid to (1) ensure hotel profitability, and (2) recoup the costs of infrastructure construction and maintenance. But development must not outpace (3) the capacity of the environment for renewal, (4) the local labour force, and (5) the level of tourist demand St. Kitts and Nevis can reasonably expect from the competitive world tourism market. Team findings are favourable on all five counts, although margins of error differ considerably suggesting the need for careful strategic planning early on.

The seven percent hotel tax is a powerful revenue producer under all reasonable projections of tourism growth which include the opening of the Southeast Peninsula. When added to the departure tax and the indirect taxes which would arise from increased economic activity, adequate revenues are available to finance essential public capital investments and service needs.

The analysis of costs and earnings for various hotel and resort configurations shows that tourism-based development in the Southeast Peninsula must perform substantially above current regional averages in order to be attractive to potential investors or developers. When one uses conservative assumptions regarding construction and operating costs, occupancy levels, and room rates and other revenues, the economics of private investment in hotel and resort facilities in the Southeast Peninsula appear marginal. It will require imaginative and tough-minded investors developing quality facilities with better than average cost control and marketing strategies and working with active support and encouragement from Government to make a commercial success of new tourist facilities in the Southeast Peninsula.

This economic uncertainty for the hotel/resort sector can be eliminated by managing the development of the Southeast Peninsula sufficiently well to permit charging high room rates and to create such an attractive, high quality environment that year round occupancy rates stay in the 75 percent range. Furthermore, the dimensions of Government's role in providing for public recreational facilities and services and other amenities and of maintaining environmental quality on the Southeast Peninsula should not be underestimated. These tasks are critical to the economic success of the tourism development strategy, which itself needs better formulation leading to a consensus.

● Land Use Allocation

The land suitability analysis confirms the availability of over three-quarters of the Peninsula for development activity, thereby giving landowners a wide degree of flexibility. The following table summarises the dimensions, use levels and density classifications for the three development zones and two types of conservation zones. There is clearly sufficient suitable land in the various density categories to support any of the tourism/residential/recreational development scenarios presented in the Land Use Plan (Appendix A) without serious injury to the Peninsula's environment. This assumes rigorous application of the development controls and environmental protection measures present in the Environmental Assessment Report (Island Resources Foundation, 1986) and this Land Use Management Plan regarding the "Limited Use Zones" and the "Conservation Zones," where the margin of error is, like the soil cover in the Moderate Use Zone and the Limited Use Zone, very thin.

● Recreation and Amenities (Natural and Built)

Recreational activity, formal and informal, by visitor and resident, will place extraordinary demands on the Peninsula environment even before the first hotel is open. The scope of required Government investment in facilities development and environmental management is much larger than previously assumed. A targeted "top-of-the-market," high value tourism style can only be sustained if the recreational amenities inventory is expanded and the environmental ambiance of the Peninsula is not just sustained but improved, a park system is established, and serious, effective environmental monitoring and management are undertaken.

A tentative amenities agenda requiring attention includes the following:

- reforestation of damaged or erosion-prone SEP areas
- roadside and public area landscaping
- nurseries for the first two items above
- navigational aids (presuming a marina is built)
- public jetty and associated parking (recommended for White House Bay)
- customs and immigration facilities/services
- fire, postal and police services
- signs and sign control
- hiking trail system, including easements
- horseback riding trail system, including easements
- archaeological and historic site development
- public toilets for SEP day visitors
- SEP recreational facilities plan
- SEP visitors centre
- public beach area at White House Bay.

#### KEY ACTION AGENDA ITEMS

- The Legal Basis for SEP Environmental Protection and Development Control

Prior to commencement of Southeast Peninsula construction projects, Government needs to provide the necessary legal and administrative framework within which an orderly but also creative process of development can take place without causing environmental damage. If Government either underestimates the dimensions of this task or fails to provide sufficient support for implementing land management policies or environment protection programmes, then the integrated development strategy proposed for the Peninsula will not be achieved.

Developing the Southeast Peninsula, even in its preliminary planning stages, has raised hard questions concerning the legal status of proposed parks, protected areas and reserves; coastal/seabed leasing procedures; easements; the private installation of facilities on public land (and its opposite); water pollution control and penalties; prevention of beach sand mining; ownership of historic artifacts; fee schedules for dumping private wastes (dredge spoil) on public property (the seabed); oil spills; and erosion damage. Existing St. Kitts and Nevis planning and environmental legislation, some very out of date, is simply not adequate to deal with many of these issues, and since October of 1985 a legal revision and drafting effort has been undertaken by the Attorney General's Office in five areas pertinent to the Peninsula's environment and its protection, management and development.

Each needs to be completed as soon as possible as the issues they can help resolve are starting to surface, and some Peninsula planning tasks are being delayed.

SOUTHEAST PENINSULA LAND USE ALLOCATION

<u>DEVELOPMENT ZONE</u>	<u>USE TYPE</u>	<u>ACRE AGE</u>	<u>DENSITY</u>	<u>SLOPE CLASS</u>
Intensive Use Zone (IUZ)	Township	50	Highest	
	Tourism/Residential/ Recreation/Marina (Little Salt Pond)	540	High	0-20%
Moderate Use Zone (MUZ)	Residential/Tourism/ Recreation/Conservation	670	Medium	20-35%
Limited Use Zone (LUZ) (steep land)	Conservation/Residential Recreation	1690	Low	35% - up
Limited Use Zone (LUZ) 1) All Ponds* except Little Salt Pond  2) Little Salt Pond	Conservation/Recreation	430		0
			Low	
			High	

<u>CONSERVATION ZONE</u>	<u>USE TYPE</u>	<u>ACREAGE</u>	<u>CONTROL</u>
Protected Area (Nag's Head)	Wildlife Reserve	80	High
Special Management Areas:			
- Peaks (6)	Conservation/Recreation	340	Medium
- Ponds (except Little Salt Pond)	Conservation/Recreation	See LUZ	Low
- Dunes	Conservation/Recreation	--	Medium
- Beaches	Conservation/Recreation	--	Low
- Coastal Waters	Conservation/Recreation	--	Low
- Marine Habitats (3)	Conservation/Recreation	--	Medium
- Hist./Archaeological Sites	Conservation/Education	--	High

\* Managed as a Conservation Zone/Special Management Area

(1) Beach Control Act - lacks accompanying regulations to regularize the issuance of near-shore, foreshore and seabed licences and leases.

(2) Southeast Peninsula Land Development and Conservation Act (in draft) - to authorise establishment of SEP Development Policy Board, an Environmental Management Unit within the Planning Office, and an inter-departmental Technical Review Council; also to delegate Planning Office as agency responsible for establishing procedures for SEP development control, for setting standards, and for initiating an application review and environmental impact assessment process.

(3) Marine Pollution Prevention Act (under the Cartagena Convention) - to enable Government to deal with undesirable polluting "discharges" into marine environments, including those of the Peninsula (e.g., sewage, dredge spoil, wrecked vessels, oil spills, etc.).

(4) Fisheries Act (draft regulations under review) - to provide monitoring and control authorization regarding fisheries, reefs, marine parks, underwater marine reserves, including those requiring management in Peninsula waters.

(5) National Park and Historic Sites Act (in draft form) - to provide a legal management framework for protected areas on the Peninsula and elsewhere in the State.

#### ● Administrative Concerns and Action Items

The Government of St. Kitts and Nevis presently confronts the difficult task of rapidly developing new or expanded planning, management, marketing and monitoring skills and services. Even a preliminary listing of these new or expanded functions will include:

- tourism facilities permitting procedures
- establishment of standards and guidelines
- design and implementation of an EIA process
- compliance monitoring
- environmental monitoring
- protected and public areas management
- land acquisition and easements
- tax, licencing and user fee policies
- legislative reform
- coordination and leadership.

The last item is the most important of all. The Southeast Peninsula development venture is not simply another "project" which can be administered or handled if a half-dozen otherwise technically skilled civil servants try to squeeze a few hours a day out of an already busy schedule to deal with the tasks required. It is rather a cluster of many diverse, interrelated projects, some very complex and all needing proper scheduling, supervision, monitoring and quality control. They would best be handled by a full-time administrator or coordinator who should, additionally, address the following longer range, more broadly conceived and equally important tasks:

- build the road
- streamline incentives for guiding private sector investment in the Peninsula
- promote the Peninsula as an asset with development potential for the country
- mobilize public support for the national goals associated with the Peninsula's development
- provide a strategy and objectives for Peninsula development
- develop a SEP/GSKN tourism marketing framework and operational plan
- manage the Peninsula's environment to ensure sustainable use for generations (and tourists) yet to come.

It is recommended that GSKN seek external funding support for administration of the Peninsula project and a full-time legal assistant, who could be attached to the Attorney General's Office, to assist with the sixty to seventy legal negotiations that will as a minimum be required in the next 24 months as Government moves to sort out issues of land acquisition, rights-of-way, scenic/conservation/utility easements, licencing, permitting, crown land leasing (foreshore, near-shore), beach setbacks, and more.

#### ● Environmental and Public Services Planning Agenda

When the special Peninsula planning tasks outlined in the EAR and the LUMP are combined, the progress made to date in "getting ready" for road construction and tourism/recreational facility development appears modest when compared to those tasks remaining. The following topical, sector, or pollution control plans will be needed in final form (with detailed cost figures) within six to twelve months:

- Feeder Roads Policy and Design (linked to land "swaps" and easements)
- Sewage Treatment
- Erosion Control
- Scenic and Recreational Over-Looks
- Building Codes (hotels, condos, residential, marina)
- Peaks, Parks, Protected Areas Management Plans

- Peninsula Wildlife (especially sea turtles, birds, monkeys)
- Access Road Maintenance
- Beaches and Dune Systems.

These are not as simple as they might appear. Each one requires substantial input from two or more ministries and cuts across sectoral lines.

● Development Control Issues

Once the SEP Land Development and Conservation Act is in place, GSKN should move rapidly to complete the following undertakings designed to assist the Planning Office in creating an orderly Southeast Peninsula programme planning, project review, quality control and environmental protection strategy.

(1) Adoption of a Land Use Management Plan for the Southeast Peninsula, supported by Environmental Impact Assessment procedures and establishment of an Environmental Management Unit within the Planning Office to provide an appropriate administrative framework to achieve the environmental goals and integrated development strategy proposed for the SEP.

(2) Organisation of the Southeast Peninsula Development Board with development policy planning and project review responsibilities as outlined in Section 5 and Appendix B of this Plan.

(3) Formal establishment of a GSKN Technical Review Council to provide technical analysis of all SEP project schemes, plans, and facilities design.

## 1. INTRODUCTION

### 1.1 Project Background

The Government of St. Christopher and Nevis (GSKN) and the United States Government through its Agency for International Development (AID) are considering a project to build a penetration road from Frigate Bay into the Southeast Peninsula of St. Kitts for the purpose of providing access to and stimulating economic development in the area. In conformance with U.S. Government regulations (22 CFR Paragraph 216, AID Environmental Procedures), an Initial Environmental Examination (IEE) was completed in June 1985 (Talbot, 1985), and a more extensive environmental assessment was undertaken by an Island Resources Foundation team of twelve specialists during the closing months of 1985. The final Southeast Peninsula Environmental Assessment Report (EAR) was submitted to the Government of St. Kitts and Nevis and to USAID in early February 1986 (IRF, 1986) and subsequently distributed to Southeast Peninsula landowners and other interested parties.

That report concluded that "... the proposed road construction will not involve unreasonable degradation of the living and non-living resources of the Southeast Peninsula and its environs ..." assuming certain conditions designed to protect the environment are met. It further concluded that "... the nature, level and pace of development likely to follow completion of the Southeast Peninsula road [would] be manageable ..." if the Government's capacity to manage its environmental resources was improved and the rate of tourism growth on the Peninsula did not exceed the maximum limit set in the Land Use Management Plan scheduled to follow the Environmental Assessment.

### 1.2 Issues and Scope of Work

On February 13, 1986, the Government of St. Kitts and Nevis, with financial assistance from the United States Agency for International Development contracted with Island Resources Foundation of St. Thomas and Washington, D.C. to produce a Land Use Management Plan for the Southeast Peninsula of St. Kitts.

Under the terms of the contract, the overall purpose of the Land Use Management Plan was:

- (1) to identify intrinsic opportunities and constraints to development of the Peninsula; and
- (2) given the anticipated population to be accommodated and the development potential of the area, to determine what composite of conservation-recreation-urbanization could avert spoilation, ensure enhancement of amenities, and equal the development values of uncontrolled growth.

Additionally, the following assumptions were specified in the Statement of Work:

- (1) that public and private powers can be joined in partnership to realise this plan;
- (2) that planned growth is more desirable and as profitable as unplanned growth;
- (3) that, given the area's scenic value and recreational resources, early and uncontrolled speculative development associated with the penetration road [could] have a devastating effect upon realization of the full potential of the Peninsula;
- (4) that the contracting team would rely heavily upon recommendations found in the Environmental Assessment prepared as an antecedent document;
- (5) that the Land Use Management Plan would be used to guide land and facility development in proposed future uses of the area;
- (6) that although no specific development strategy had been elaborated by the Government of St. Kitts and Nevis, the contractor essentially would prepare such a strategy through the Land Use Management Plan;
- (7) that the contractor should coordinate closely with USAID, the Government of St. Kitts and Nevis and other donors and potential investors in Southeast Peninsula development, so that the costs and consequences of various land-use options might be accurately evaluated;
- (8) that a locally selected technical resource committee would be formed and provide technical assistance regarding input to Peninsula development;
- (9) that the contractor would make such presentations as were appropriate before public-interest groups in the state regarding the facts of the Environmental Assessment, Land Use Management Plan and the potential for land development on the Peninsula.

### 1.3 Terms of Reference

The specific terms of reference for preparing the Land Use Management Plan stated that two broad options for designing the development strategy were to be evaluated:

- (1) Full land and facility development: mass tourism development with little conservation and some protected recreational areas for designated uses.
- (2) Limited land and facility development: strong emphasis on conservation, smaller hotel activity with many designated use options.

The broad plan was to include the following land use zones: development, conservation, recreation, and limited/special uses. The nature and sustainability of development was to be based on adequate suitability/capability classifications and mapping criteria, resulting in a framework for decision-making about which areas can sustain what kind of development and why.

#### 1.4 Operational Factors

Early in the analysis phase of this project it became clear that the full-scale, high intensity development option appeared to be both socially and environmentally unacceptable, while the limited land and small guest house facility development option generated negative economic indicators. Therefore, several "in between" options or development scenarios were selected for further investigation. Based on available documentation, two of these alternatives were selected and then presented in more detail, with one -- referred to as "the manageable growth scenario" -- being the preferred model to be employed by Government to guide the incremental process of development on the Peninsula.

A total of 13 landowners were consulted (in person, by telephone, and by correspondence). Several provided very helpful information and cogent recommendations. In addition (as described in more detail in Section 4 and particularly in Appendix A), dozens of computer runs were made on the various development scenario models, testing their sensitivity to key variables which reflected different assumptions and conditions. After project activities had commenced, team members learned that it was possible available donor funding might only be sufficient to construct the more difficult segment of the proposed road (from Frigate Bay to White House Bay over the Peninsula's steep spine). This contingency resulted in additional computer runs as portrayed in Appendix A, Table A-26.

#### 1.5 Conclusion

IRF investigators believe, after a nine-month research and planning effort focussed on the Southeast Peninsula, that the proposed road will serve as an effective stimulant to development. It also offers the prospect of serving as a watershed event for the entire country, both symbolizing and actualizing the opening up of new national opportunities.

This Southeast Peninsula Land Use Management Plan, even if followed carefully, will not guarantee that St. Kitts and Nevis will win, place or show in the Eastern Caribbean tourism race. There are too many other factors for it to be more than one element in any long-range St. Kitts tourism success story. However, using the plan (in company with its predecessor document, the Environmental Assessment Report or EAR) as guides for developing and protecting key features of the Peninsula ecosystem or landscape will guarantee that twenty years from now a new generation of Kittitians will still find there wildlife, scenic areas, clean water, and open (as opposed to foreclosed) development options. The Peninsula will still be a place of curiosity, excitement, green spaces, and opportunity -- a place to be proud of and enjoy.

## 2. BACKGROUND ... AND FOREGROUND

### 2.1 The Place: Southeast Peninsula Landscape Features

In everything, respect the genius of the place.  
(Alexander Pope, Essays on Man, 1733)

There are only three real island peninsula systems in the Eastern Caribbean, and one -- the area extending southward from Vieux Fort, St. Lucia is very small and lacks the narrow isthmus of a true peninsula. The second, the more rugged and exposed Presque ile de la Caravelle on the east coast of Martinique, French West Indies, is over 30 km from Fort de France, already partially developed, has few good beaches, no leeward coast and cannot begin to compare with St. Kitts' "Presque ile de sud-est."

At one time, of course, the Southeast Peninsula was itself a true island -- actually a cluster of seven volcanic islets subsequently joined together and to St. Kitts proper by drowned coral reefs topped by broadened, flat sedimentary plains. Six interior saline empondments are interspersed among gently rounded, mature convex peaks, several of which are over 500 feet and one over a thousand. Together, they visually, but not actually, link St. Kitts to her sister island of Nevis.

The Peninsula is a wonder to behold. There is simply nothing quite like it -- undeveloped as it is -- in the entire Eastern Caribbean. Within six square miles of mostly open rolling terrain, one finds a mosaic of segmented rugged promontories, multiple hills, ridges, valleys, green pastures, wildlife, salt ponds, eleven light sand beaches, five small boat anchorages within ten significant arcuate bays, linear coral reef barriers against storm waves to windward and beautiful, more diverse patch reefs on a broad sloping submerged shelf to leeward. Landscape features are angled, as if by an architect's design, across the prevailing wind for optimum natural cooling, and all are within ten miles of a jet airport, an urban centre and a deep water port.

It is, all at once, a very special place, a development planner's dream and an environmental planner's nightmare -- a dream because of its diverse natural features, a nightmare because the Peninsula is like some miraculous, recently discovered, self-winding clock that is mysteriously kept running by a combination of outside energy forces generated by sun, tide, weather, and waves. The Peninsula is about to be "fixed" or adjusted to suit special purposes. But we do not yet know exactly how it works, which are critical or non-critical parts or whether it is tamper-proof. We do know, because it has a lot of working, interlinked parts and has a history of misuse, that it is prudent to be cautious when making major changes if we are to avoid interrupting the surviving natural systems.

This is, of course, the job of a land use planner, i.e., to determine what land can be used without interrupting its associational relationships to other parts of the adjacent land system or its surrounding environment. Common sense tells us the parts are somehow interconnected. But in the beginning, we usually do not know how or which natural and physical linkages are important and which are not.

## 2.2 The Problem: What Is Land Use Planning?

Land use planning procedures for the Southeast Peninsula provide a framework for assessing the physical and natural features of the area and for determining long-term sustainable uses. These former agricultural lands, now virtually unused, have been identified to play a role in the future development of St. Kitts and Nevis. Land use planning tasks will help to define that role.

There are two general approaches to land use planning:

1. The first starts with a specific land use requirement, such as the need for a hotel, a marina, a sewage plant or a road (or all four at once). This form of land use planning translates the requirements of the intended use into biophysical site criteria to permit measurement of the best "fit" between the anticipated use and the features of each potential site.

With this approach, the land use planner addresses not only the question of where to put a specific activity or facility but where not to put it. He or she faces questions of where not to cluster incompatible uses or where synergistic or compatible uses could be clustered for reasons of efficiency, cost, or reduction of environmental impact.

2. The second approach starts with a given area of land and focuses on how to use it in an optimum or best-use format. Ancillary issues include: which assemblage or mix of appropriate, sustainable uses will promote national and human well-being while at the same time guaranteeing an economic return and protection of the natural environment? The task is complicated as the planner attempts to identify alternatives and uses that will close off the fewest options for future development alternatives and uses.

A classification system for "suitability assessment" helps to identify those portions of land with the greatest potential for rational and efficient long-term management by sorting out which lands should be retained essentially as they are with minimal human intervention as opposed to which lands are suitable for modification in some specified format.

(This land use planning effort for the Southeast Peninsula has employed both of the above approaches, in response to the original terms of reference.)

An underlying assumption of land use planning is that the natural biophysical environment represents a functioning ecosystem which may be used (and even modified to a degree) in an efficient, safe, and pleasantly acceptable manner for human well-being. It assumes that some specific pieces of land are more suited to certain uses or modifications over the long-run than others. This of course does not restrict action, but it does suggest that if certain choices are made the risk of damage or long-term failure is greater.

This is especially important for St. Kitts and Nevis because within the Eastern Caribbean context there are many examples of failure to address these principles and embrace the practice of environmental assessment and land suitability analysis. This has resulted in all-too-frequent examples of derelict lands with fertility gone, accelerated erosion from overbuilt steep slopes, a loss of wildlife species and habitat, impaired water quality from sedimentation and other pollutants, aggravated flooding, and conflict between incompatible uses. Most of these consequences or manifestations of ill-advised actions could have been and can be avoided by better land use planning.

Preparation and dissemination of this Land Use Management Plan will not dictate land uses to Government or landowners. The "best use" has not been identified. Ecologically-based planning will only suggest an array of uses which are suitable and which are not suitable. The specific sustainable use for a given unit of land or the mosaic of uses for an entire system should be determined by those directly responsible for the land and its development. In the case of the Southeast Peninsula this is the group of individual landowners and Government resource managers. But they need to be presented with a framework for land assessment and land suitability which provides guidelines for development.

### 2.3 The Procedures: Management Alternatives

Land use management planning is simply the application phase of land use planning -- an exploration and definition of the most effective ways to direct changes being made in the landscape. It seeks to ensure an efficient exchange of information among private and public sector interests (leaders, owners, users, beneficiaries and technicians) and to accelerate and inform the decision-making process regarding choices which affect the ecosystem and the state. Some choices, of course, should and will be market-driven, but others relating to social, political and environmental risks and costs should be policy-driven. What is required is balance.

The land use management planner, therefore, attempting to balance private and public interests, will establish a range of policy options for land use which addresses the following development issues or design questions, in this case for the Southeast Peninsula:

- (1) The acceptable pace of development (rate of change)
- (2) Quality vs. quantity
- (3) Performance standards
- (4) Incentives and penalties
- (5) Short vs. long-term objectives
- (6) Environmental system gains and losses
- (7) Distribution of gains and losses.

Once a range of workable and acceptable options has been identified, the next step for the planner is not to make the choice but to provide guidelines (i.e., the land use management plan) for arriving at decisions. The resulting plan is therefore partly like a compass, partly like a road map, partly like a travel guide -- it provides a general direction and displays alternative routings while alerting the user to indicators to watch for enroute.

When the objectives are established and a consensus exists, the day-to-day technical site-specific land use planning questions are more easily resolved because the operating rules are clear and become the norm. Exceptions, even conflicts, will emerge, but the point is that they are exceptions -- few as opposed to the many. Accepted practices dominate, whereas the occasional exception is negotiable. Under such conditions, the landscape of the Peninsula and the tourism development strategy for the Peninsula are both sustainable, and the Government/private sector partnership will succeed.

#### 2.4 The Programme: Toward a Strategy

If the Southeast Peninsula of St. Kitts is a remarkable place as is argued in Section 2.1 above (and as documented in the EAR), and since undeveloped, scenically well-endowed six square mile peninsulas with recreational potential are rather rare, St. Kitts and Nevis has the opportunity and perhaps the destiny of creating either a small world-class tourist complex or a small world-class national recreation park. In either case, the benefits would be enormous, although different.

It is suggested that, from a land use planning perspective, perhaps it could do both and should do both for practical reasons: namely, that neither one can succeed as well without the other.

Scenario #1: In the best of all possible worlds (which means GSKN had the necessary capital), Government would immediately:

- (a) purchase the entire Peninsula;
- (b) declare it a national park;
- (c) install a full-service infrastructure (roads, water and power supply systems, riding and hiking trails, visitor centres, a jetty, public recreational facilities, scenic areas, cricket pitches, a museum, environmental research centre, etc.);

- (d) promptly lease back to former landowners on very favourable long terms 100 to 150 acres of the prime land at each of the high tourism potential areas for private sector, investment-funded tourism development (smaller superior quality hotels, condominiums, guest houses, marinas) with incentives for adhering to strict guidelines on siting, building design, style;
- (e) market the assembled package
  - as a resort system that had in effect entered into a "pact with nature" and was as good as or better than Caneel Bay (St. John), Little Dix (Virgin Gorda), or Dorado Beach (Puerto Rico)
  - as a resort-style of the future where the guest is not renting a room but access to a full service national park/vacation/resort system with diverse amenities, a managed environment and a guarantee of quality.

Scenario #2: In a more practical vein, GSKN could utilize a lower cost strategy and:

- (a) announce the establishment of a new Southeast Peninsula National Park planning framework (GSKN already owns all the surrounding seabed, the beaches and half of Sir Timothy Hill and will acquire the road right-of-way as well);
- (b) install the infrastructure as currently scheduled;
- (c) arrange/negotiate protective conservation easements for all areas zoned "limited use zones" or "protected areas" (title would reside with the landowner); easements could conceivably be exchanged for Government assistance with investment loan guarantees, tax concessions, or on a fee basis; acquire land for public recreation and service facilities;
- (d) appoint a Parks Director and staff (or their equivalents) and manage the area as a national recreational park;
- (e) market the package as per (e) above.

Scenario #3: This option involves a less "highly managed," more private sector and market-driven strategy; yet it still requires both a significant level of public sector investment in infrastructure (road, water, power, trails, jetty, etc.) and a development control/amenities management framework. This scenario reflects the model presented in Appendix A of this report (see especially Tables A-19 to A-24). The strategy includes the following elements:

- (a) GSKN formalizes the SEP Land Use Plan, the Environmental Protection Programme (see EAR), the SEP Integrated Development Plan, and supporting legislation;
- (b) GSKN confirms SEP road right-of-way, project agreements, construction contract, and establishes SEP Development Board (see Section 5 and Appendices B-C), with operating procedures, rules and regulations;

- (c) Environmental Management Unit (EMU) is established, environmental education programme initiated, and Environmental Impact Assessment (EIA) project approval procedures formalized;
- (d) SEP environmental monitoring starts with pre-road construction, base line coastal water quality measurements, etc.;
- (e) recreation plan and beach, sea turtle, water, wildlife, protected area draft management plans completed;
- (f) SEP trails, wildlife and protected areas easements negotiated and management system established;
- (g) SEP marketing plan developed;
- (h) road and public area landscaping, sign control, and maintenance plans developed as road nears completion;
- (i) construction of jetty, parking area and public facilities at White House Bay commences;
- (j) road is opened.

The point of the first two scenarios above is to illustrate that the Peninsula could be treated and developed both as a special kind of national (tourism) park and a tourism/recreational area development project. In effect, it could be suggested that the Southeast Peninsula deserves a development strategy unique to both St. Kitts and Nevis and to the Eastern Caribbean. It is a strategy never employed elsewhere in the region, although Laurance Rockefeller came close on St. John with development of the exclusive Caneel Bay Plantation, surrounded and serviced as it is by the Virgin Islands National Park. The idea is, at the very least, an option to be evaluated. It is addressed in more detail in Appendices I and L because the approach offers an unusual marketing opportunity which targets an up-scale segment of the North American and European tourist markets.

The third scenario leaves the bulk of promotional and marketing activities to the private sector (landowners), whose performance should be closely monitored and evaluated by GSKN which must be prepared to exert accelerating or decelerating influences, as required, to maintain a manageable pattern of growth and minimal negative impacts.

## 2.5 The Plan

Guidelines for selecting uses compatible with the Peninsula's unique ecology are detailed in the Land Use Management Plan which follows. Technical data and guidelines are provided in the Appendices.

The Land Use Maps (Sheets # 1, 2, 3 and 4) and the land use zones displayed thereon represent preferred broad classifications. Boundaries separating distinct zones are neither inviolate or precise lines, but when a contrary position is taken, then the burden of proof falls to the proponent and will be resolved only after detailed site analysis, mapping, and impact assessment procedures are carried out.

### 3. LAND USE PLAN

#### 3.1 The Land Classification Framework

##### 3.1.1 Zonation

The Southeast Peninsular landscape, excluding submerged shallow near-shore areas, embraces some 3,800 acres -- nearly six square miles of largely undeveloped, diverse terrain as described in some detail in the SEP Environmental Assessment Report (IRF, 1986).

While Peninsula landscape diversity is a key component of the area's development potential, it is also a problem for the planner seeking to determine the range of choices open for putting a large assemblage of associated specific sites or pieces of land to their most productive use or uses at the lowest possible financial and environmental costs. Even using five acre units (the smallest mapping unit employed by the SEP Land Use Planning Team), there are 760 land units or parcels to be characterized as to specific intrinsic features, each presenting both constraints and opportunities.

For example, on any given five acre unit, a single factor like "height" (above sea level) affects accessibility negatively, scenic value positively, scenic impact negatively, and natural cooling positively. "Height" also raises the erosion potential and engineering costs but lowers the risk of direct impact on beaches and coastal water quality and tends to lower the allowable loading density/acre. There is a similar spread of positive and negative factors attached to other land unit characteristics like spatial/proximal location, slope, soil type, vegetation, exposure and height below sea level (ponds and submerged lands). These all need to be addressed.

To accomplish this task, the Land Use Planning team, therefore, undertook a land classification/suitability analysis which, in turn, required a systematic disaggregation or "sorting out" process for the 3,800 acres to identify differing land characteristics affecting resource development and management options. Reassembly of the results of this process provides a geographic framework of discrete mappable development and management units -- two major zones, each having its respective sub-zones. They are as follows:

#### (1) DEVELOPMENT ZONES

- |                               |  |
|-------------------------------|--|
| a) <u>Intensive Use</u> (IUZ) | high density tourism,<br>township, etc.              |
| b) <u>Moderate Use</u> (MUZ)  | lower density tourism,<br>residential, mixed         |
| c) <u>Limited Use</u> (LUZ)   | low density residential,<br>recreation, conservation |

## (2) CONSERVATION ZONES

- |                                    |  |
|------------------------------------|--|
| a) <u>Protected Areas</u>          | nature reserves, requiring strict conservation measures  |
| b) <u>Special Management Areas</u> | requiring site specific controls, limited conservation measures and selective non-destructive uses |
| - Peaks                            |  |
| - Ponds                            |  |
| - Dunes                            |  |
| - Beaches                          |  |
| - Coastal Waters                   |  |
| - Marine Habitats                  |  |
| - Historic/Archaeological Sites    |  |

## 3.1.2 Classification Criteria

The land use zones listed above were arrived at in the following manner. Using the EAR document as a point of departure (which had previously identified natural areas and features requiring some extensive and some intensive degree of protection), the land use study team undertook a more detailed analysis regarding slope, soil, scenic and ecosystem features, working at both a 1:2500 and 1:25,000 mapping scale and combining site visits, aerial photo interpretation, landscape photography (color) and extensive interviews with owners, managers, resource users and specialists.

The first stage in this process, slope analysis, is provided as Figure 3.1 with Peninsula soils and erosion susceptibility displayed in Figure 3.2 (each accompanied by a explanatory table, Tables 3.1 and 3.2). With this information available, it then was possible to establish the criteria for determining suitable use types and intensity levels for Peninsula landscape. These criteria for delineation of the development sub-zones included: slope, height, visual impact (scenic exposure), and accessibility, with slope being the primary consideration (see also Table 3.3). Slope has a direct relationship to soil type and depth; both have serious implications for sewage disposal and potential erosion caused by construction and access roads.

This process resulted in the following classifications, to be applied as a general rule:

<u>Slope Class</u>	<u>Development Sub-zone Classification</u>
0-20%	Intensive Use Zone (IUZ)
20-35%	Moderate Use (MUZ)
35% plus	Limited Use (LUZ).

Although slope predominated as a preliminary selection criteria for classifying development zones, there are cases where visual/scenic or environmental considerations override. For example, this is true of

Table 3.1. Land slope factors and development options.

	<u>0 - 20%</u>	<u>20 - 35%</u>	<u>35% +</u>
BUILDING CONCEPT	FEW (1) CONSTRAINTS (except height)	SOME (2) CONSTRAINTS	SERIOUS (3) CONSTRAINTS
ACCESS	ALL MODES (4)	MOST MODES (5)	VERY LIMITED (6)
SEWAGE DISPOSAL	DEPENDING ON SUBSOIL (7)	LIMITED OPTIONS (8)	VERY LIMITED & SPECIFIC (9)

(1) Generally few constraints on construction, in shallow coastal areas, coastal flooding will need to be taken into consideration. High ground water table will in some areas be of concern.

(2) Some limits on types of construction will be experienced, and the cost of construction will increase. Larger structures will be more affected than smaller structures. Erosion hazard becomes a serious concern, and site development will need to be closely monitored and controlled. All development activities need to be designed to result in minimum earth change.

(3) In this slope range, normal concepts do not function. Development activities become increasingly costly and disruptive to the environment. Vertical construction components (like columns) must compensate for differences in land elevation. Excavation needs to be kept to the absolute minimum to control soil erosion. Special building design concepts and construction methods need to be employed. Earth moving equipment should not be used; excavation for footings/foundations should be carried out with hand tools or power assisted tools. Erosion hazard is severe (see Lang and Carroll, 1966). Engineering considerations take precedence over design concepts.

(4) Pedestrian and vehicular access to facilities and buildings will have few if any constraints. Cost will likewise be minimal.

(5) Vehicular access becomes more difficult or alternatively costly if installed to reasonably good standards, including good drainage facilities. Drainage swales require protection from water erosion. Fill slopes must either be sufficiently shallow (less than 50%) to be stabilized by vegetation or, if steeper, retaining walls or other structures are required to lessen the slope. As the slope increases, cuts into hillsides become deeper and result in a visual intrusion upon the landscape. Accessibility by heavier vehicles becomes increasingly problematic. Cluster development is recommended to minimize site disturbance and site development costs.

(6) Access to dwellings will be by pedestrian walks or special conveyances. Vehicular access will generally not be feasible. Special provisions need to be made for emergency services: Only clustered development will be appropriate.

(7) Sewage disposal (septic tanks, seep-aways) can be utilized if appropriate soil exists in the absence of high groundwater tables. Site specific percolation tests will need to be done. The planting of hydrophilic plants (bananas, sugarcane) over soak-aways will minimize disposal problems. Based on Lang and Carroll (1966), most of the soils in this range are Loam and Clay Loam with high permeabilities; however, the water table is also close to the surface.

(8) Limited options exist since with increasing slopes the soil cover becomes less thick. Over rocks much of the soil is Fine Sandy Loam (Lang and Carroll, 1966) with depth to rock from 12" to 36". If drainfields are utilized, special attention will need to be taken in the design and construction; otherwise sewage effluent may surface and pose a nuisance and health hazard.

(9) Sewage disposal only by sewage collection systems and treatment at a common facility. Other options would be composting toilets or other facilities where no disposal into the ground is required.

Table 3.2. Characteristics of St. Kitts, Southeast Peninsula soil mapping units (see also Figure 3.2).

Map Symbol	Soil Type	Dominant Slope Range	Drainage Through Soil	Any High Water Table	Moisture Supplying Capacity	Root Limiting Layer	Erosion Hazard	General Fertility	Any Special Management Problems	Stones-Boulders
1.	Cockleshell Bay Loamy Sand	0-2 degrees	Very Rapid	--	Very low	Nil	Danger of wind erosion if clean cultivated	Low	Low fertility; windblast	Nil
2.	Frigate Bay Loamy Sand	0-2 degrees	Very Rapid	--	Very low	Nil	Danger of wind erosion if clean cultivated	Low	Low fertility; windblast	Nil
3.	Bird Rock Loamy Sand	2-10 degrees	Rapid	--	Low	Nil	Gullyng on steeper slopes	Moderate	Moisture conservation; stoniness	Generally stony and bouldery
27.	Conaree Hills Loam	2-10 degrees	Moderate	--	Moderate	Solid parent material	Moderately low	Moderately low	Stoniness	Generally stony and bouldery
28.	Sir Timothy's Clay Loam	15-35 degrees	Moderate	--	Moderate to low	Solid parent material	Topsoil easily lost	Low	Shallow Soil on steep slopes	Stony & bouldery with rock out-crops
30.	Salt Pond Sand and Loamy Sand	0-2 degrees	Rapid	Usually below 2'-3'	Moderate, but water usually brackish	Nil	Very Low	Low	Low fertility; salinity	Nil
32.	Friar's Bay Clay and Silty Clay	0-2 degrees	Very slow	Usually at 6" or less	High, brackish water	Wet, saline soil	Very Low	Very low	Excessive salinity	Nil

Source: Adapted from Lang and Carroll, 1966 (Appendix A). For Southeast Peninsula geological features, see Figure 2.3 in Island Resources Foundation, Environmental Assessment Report, 1986.

Table 3.3. Criteria for determination of development zones.

CRITERIA	Development Zones		
	Intensive Use (IUZ)	Moderate Use (MUZ)	Limited Use (LUZ)*
Slope			
0 - 20%	Encouraged/Yes	Encouraged/Yes	Encouraged/Yes
20 - 35%	Allowed in specific locations/Yes	Allowed/Yes	Allowed/Yes
35% Plus	None	None	Allowed/Yes
Visual Scenic Impact	Negligible	Moderate	High
Road Access	Unrestricted in all areas	Unrestricted in most areas	Restricted and difficult in most areas

\* Areas designated for Limited Use are characteristically vulnerable to high visual scenic impacts that may irreparably damage and depreciate the landscape.

the Nag's Head peninsula (see SEP Land Use Map #3) where small areas of less than 20% slopes are included in the MUZ. Intensive, obtrusive uses on the highly exposed plateaus of this sub-peninsula would produce an undesirable negative visual impact on the entire SEP landscape. At other locations, both the physical difficulties and the cost in constructing environmentally damaging access roads may discourage building in certain smaller areas even though they have acceptable slope conditions. Therefore, only readily accessible areas have been identified as prime candidates for intensive uses and have been designated as such on the accompanying Land Use Maps.

As noted above, because of the scale used for mapping, areas less than five acres have not been separately delineated. It is possible, therefore, that very small areas having the potential for intensive use may not be so designated if only the slope class is used as a criterion. In reviewing development applications for such areas, it will be necessary for the Planning Unit or any other designated Authority to consider all the criteria for determining acceptable levels of use so as to arrive at decisions that are both fair to landowners but not injurious to the landscape, including that surrounding or adjacent to the parcel in question.

### 3.1.3 Suitability and Use Criteria

Additional criteria utilized in the classification system relate to the land's capacity and suitability to support certain prospective uses on a sustained, longer term basis without requiring costly compensatory or remedial interventions. The dominant generic use proposed for the Peninsula's 3,800 acres is as a tourism/recreational complex. This is an older, much vetted idea going back several decades. Nearly 18 years have passed since the then Government of St. Kitts-Nevis-Anguilla first commissioned and paid the British firm of Brimer, Martin, Maggs, Keeble and Partners to prepare a design and cost estimate for "A Road to Cockleshell Bay From Frigate Bay, St. Kitts" (May 1968), and separately commissioned a land use and tourism development plan. Since that time, at least six other road and/or large-scale tourism development schemes have been commissioned or received by Government (see Beard Dove, 1981 and Preinvest, 1985).

These older assumptions regarding the tourism development potential of the Peninsula have been confirmed by this study and therefore have contributed to shaping the land classification criteria used by eliminating from our consideration other possible but incompatible uses (such as light industry) and by elevating the significance of selected features such as scenic ambiance, skyline integrity, and environmental quality.

In sum, the analysis criteria and standards for allocating appropriate suitable tourism "uses" on the Peninsula are higher and in some cases different as it is essential to prevent environmental degradation from both site specific but also cumulative, aggregate effects on the system. Therefore, this plan has been (and future Peninsula development

should be) guided by a number of key principles in selecting land areas to be converted to new uses.

(1) While perhaps half of the area is too steep or too fragile or too critical a habitat to develop, a significant portion is similar to Frigate Bay in geology, topography and other landscape characteristics and could readily satisfy the demands for tourism accommodation units, first and second residential homes, and recreational services for the next 20 years, based on projected demand.

(2) Frigate Bay style development, with respect to both hotel and residential density, should be employed only in designated intensive and moderate use zones to minimize the urbanization of the SEP. Subdivision developments with small lots, 4,000 to 7,000 sq. ft., such as those at Bird Rock, Harbour View or Suncrest, should be confined to the intensive use zone only.

(3) Intensive clustering strategies of built facilities are generally preferable to dispersed siting patterns and the sprawl phenomena. Green spaces are vital to all zones, however, even the urban/intensive use zones.

(4) Large-scale development projects on the Peninsula should be spread over the longest possible time frame and should be designed to be carried forward in stages, to reduce temporally concentrated impacts and encourage mid-project re-design if necessary.

Zone classification and use criteria for conservation areas were derived principally from the findings of the SEP Environmental Assessment Report but have been modified to reflect the following considerations and assumptions arising out of the land use planning experience.

(1) Landscape features and habitats considered critical to maintaining the Peninsula's natural system as required by the anticipated tourists and local recreational users, have been identified.

(2) As demarcated in this Plan, conservation zones include a broad spectrum of areas from strict reserves (with little direct human access and use) to sensitive segments of the LUZ's, MUZ's, and IUZ's (e.g., peaks, beaches, ponds, and archaeological/historical sites) requiring spec-

ial, focussed conservation practices if anticipated use levels are to be maintained without inducing or accelerating adverse environmental impacts.

### 3.2 Development Zones

The land use scheme proposed would allow development to occur in over three-quarters of the SEP, thereby giving landowners a wide degree of flexibility and options. However, good land management requires that the intensity type of development be varied to achieve both harmony and functional objectives in land use. Thus, three zones of varying development intensities are suggested. The SEP Land Use Maps (Sheets #1, 2, 3) show the location and boundary delineation of these three zones. The approximate acreage assigned to each gives some indication of the potential for development of the area (see also Table 3.4 which shows the land uses allowed for each zone):

<u>Development Zone</u>	<u>Approximate Acreage</u>
Intensive Use (IUZ)	50 acres - township 540 acres - tourism, etc.
Moderate Use (MUZ)	670 acres
Limited Use (LUZ)	2120 acres

While zone classifications are firm, zone boundaries should be considered as approximate to reflect the margin of error implicit in our aerial photo interpretation, mapping scales, and limited on-site georeferencing capabilities during ground-truthing field work. It should be noted that while land uses are prescribed by zones, site specific recommendations are not made. Therefore, the authority responsible for development control of the SEP will be required to exercise judgement in reviewing applications for specific locations to ensure that proposed development is environmentally compatible with the site, conflicts are kept to a minimum, and impact mitigation measures are planned and executed.

As specified in the EAR and in Table 5.1, building guidelines, permitting rules and regulations and, for larger projects or any project in high risk areas (such as a conservation zone/special management area), an Environmental Impact Assessment process will need to be in place to assist the Planning Office or an appropriately designated control authority.

#### 3.2.1 Intensive Use Zone (IUZ)

The designated IUZ will bear the main development thrust on the SEP. Most land uses are allowed in the zone with the exception of

Table 3.4. Permitted land use by development zones.

LAND USE CATEGORIES	Development Zones		
	Intensive Use (IUZ)	Moderate Use (MUZ)	Limited Use (LUZ)
<b>TOURISM</b>			
Hotels	X	X	
•Guest Houses	X	X	
Tourism Condos	X	X	
Other Tourism Related, e.g., restaurants, bars discos, watersports	X	X	
<b>RESIDENTIAL</b>			
Residential Condos	X	X	X*
Other Cluster Developments	X	X	X*
Subdivisions	X	X	
Single Lot Residences	X	X	X
<b>URBAN TOWNSHIP</b>			
Commercial	X		
High Density Residen- tial, e.g., Apartments	X		
Marina	X		
Other Urban e.g., Public buildings, Parking	X		
<b>LIMITED COMMERCIAL (Outside Township)</b>			
e.g., Restaurants, Bars, Clubs	X	X	
<b>RECREATION</b>			
Golf Course	X		
Tennis Courts	X	X	X
Horseback Riding (Trails)	X	X	X
Hiking (Trails)		X	X
Camping		X	X
Hunting		X	X
Scenic Lookout Facility		X	X
Beach Recreation	X	X	X
<b>MIXED USES</b>			
Farming	X	X	
Green Houses	X	X	X
Nurseries	X	X	X
Mariculture	X	X	

\* Allowed only under strict density guidelines.

those producing high noise levels, noxious odors or public health hazards such as toxic discharges, which by their nature do not fit. Based on the land capability analysis of the SEP, and considering Government's policy to expand the tourism sector, the predominant activity in the zone will be tourism and its associated uses. Residential development for first and second homes is expected to be another major land use. Land use in the IUZ can be relatively more intense (although green space should still be provided for) and in the case of a town or "urban" area at White House Bay more mixed than in other zones (to encourage a concentration of commercial and service functions and discourage sprawl and linear development of these activities along access roads which should be well landscaped "parkways").

Therefore, the planned evolution of a commercial village centre within a township (Salt Pond Village?) at White House Bay is suggested. The distance of Basseterre from the major IUZ at the Great Salt Pond area justifies a more convenient location of commercial and public services in close proximity to the targeted clientele. The likely proximity of a marina and public jetty and marine transport node reinforces this concept. The "township" would allow economies of scale on investment in urban infrastructure and would lower the risk to tourism and residential real estate values due to uncontrolled, decentralized commercial development.

Even outside the boundaries of the town, the allowed densities within the IUZ would be greater than those of the MUZ and LUZ. Maximum allowable densities for hotels/condos and residences are given in Table 3.5. For the IUZ thirty-five (35) rooms/units and seventy (70) beds per acre is the maximum allowed density for hotels and condominiums. For residential development, the maximum unit/acre density is eight. This does not mean that 8 units/acre developments will be allowed at all sites within the IUZ. Rather, the development control authority must exercise discretion on the compatibility of each proposed development project with the site on which it will be located.

The density limits imposed on the IUZ would not necessarily have to apply to the town area (yet to be demarcated), which could be allowed urban level densities approaching those of Basseterre, Sandy Point and other urban sites, that is, in respect of rooms/acre, site coverage and gross floor area ratios. It is premature at this time to specify precisely town density limits or height restrictions, but as an interim measure until a formal town plan is developed, it is suggested that the basic IUZ rules apply.

The White House Bay township should be planned to accommodate commercial and social services warranted by development of the Peninsula. Residential development in the town will emerge as a matter of course since people have a tendency to gravitate toward growth centres. The proposed township is identified on the land use map, but in order to guarantee that it will be adequately laid out and serviced with infrastructure, the following steps are necessary:

Table 3.5. Maximum allowable densities for hotels/condominiums and residences.

	Hotels/Condos							Residences <sup>(1)</sup>						
	Rms/Acre	Beds/Acre	Site Coverage	Gross FAR <sup>(4)</sup>		Height (Storeys) <sup>(2)</sup>	Total Rms Facility	Unit Acre	Units/Plot <sup>(3)</sup>	Site Coverage	Gross FAR <sup>(4)</sup>		Height (Storeys)	
				Flats	Slopes						Flats	Slopes <sup>(2)</sup>	Flats	Slopes <sup>(2)</sup>
Intensive Use Zone (IUZ)	35	70	60%	1.2	N/A	3	250	8	1	50%	1.0	N/A	2	N/A
Moderate Use Zone (MUZ)	18	36	60%	1.0	1.2	2	50	4	1	25%	.50	.50	2	2
Limited Use Zone (LUZ)	N/A	N/A	N/A				N/A	2	1	25%	N/A	.30	N/A	2

<sup>(1)</sup> Density Requirements for Residential Condos, Apartments and Other Cluster Type Developments Should be Similar to Hotel Condos, for IUZs and MUZs.

Distance between such buildings should be: 30 ft. 1 storey building  
 45 ft. 2 storey building  
 60 ft. 3 storey building

<sup>(2)</sup> Slopes would be land above 20%.

<sup>(3)</sup> More units can be allowed in cluster type development as long as overall density limit of 2 units/acre is not surpassed.

<sup>(4)</sup> Floor Area Ratio

(a) Agreement by the landowner(s) to undertake the town project as a real estate commercial venture, that is, in preference to land acquisition and development by Government.

(b) Preparation of a master plan, outlining land uses, infrastructure requirements, economic and financial feasibility and reflecting long-term GSKN objectives.

(c) Government incentives and conditions, details of which must be worked out.

(d) A commitment by Government to purchase selected land parcels for public purposes. Government may choose to provide the infrastructure in exchange or partial exchange for land it needs.

As conceptualized, the town would include:

- A public jetty, with supporting public parking, cargo storage area, toilets, dockmaster's office, Fisheries Unit office and workshop
- Official Port of Entry status, with immigration and customs services
- A Government complex, housing police, fire services, Public Works, a visitors centre, and other public service activities
- The White House Bay beach recreation/commercial park
- Shopping, banking and other commercial and service establishments
- Marina at Little Salt Pond
- Road link to the Great Salt Pond ring road and green belt.

The remaining designated IUZ's comprise five areas, with their respective subdivisions as shown below. Table 3.6 shows the assumed potential of the various subdivisions or sub-zones. The potentials indicated are based on preliminary assessments, subject to modification by the GSKN/Planning Unit.

The IUZ sub-zones are:

- (1) Immediate Great Salt Pond area, including:

- WhiteHouse Bay
- Sand Bank Bay
- Surrounding Slopes

Table 3.6.  
Intensive use zones:  
land use options.

	TOURISM				RESIDENTIAL					URBAN				RECREATIONAL						OTHER USES						
	Hotels	Guest Houses	Tourism Condos	Other Tourism	Res. Condos	Cluster	Sub-Division	Single Lots	Commercial	Residential High Density	Marina	Other Urban	Limited Commercial	Golf Course	Tennis	Hiking	Horseback Riding	Camping	Hunting	Scenic Facility	Beach	Farming	Green Houses	Nurseries	Mari-Culture	
GREAT SALT POND AREA																										
-Great Salt Pond																					●					●
-Little Salt Pond																										●
-White House Bay			●		●	●			●	●	●	●			●							●				
-Sand Bank Bay	●	●	●	●											●							●				
-Surrounding Slopes	●	●	●	●	●	●	●									●										
FLEMING ESTATE AREA																										
-Banana Bay	●	●	●	●											●							●				
-Cockleshell Bay	●	●	●	●											●							●				
-Mosquito Bay	●	●	●	●											●							●				
-Fleming Estate/ Adjacent Flat Lands					●	●	●	●				●	●	●	●	●						●	●	●		
-Surrounding Slopes		●	●	●	●	●	●	●								●										
-Salt Pond											●															●
MAJOR'S BAY																										
-Major's Bay	●	●	●	●								●		●												●
-Adjacent Flat Lands		●	●	●	●	●	●	●				●				●						●	●	●		
-Surrounding Slopes			●		●	●	●	●								●										
-Salt Pond											●															●
FRIAR'S BAY																										
-South Friar's				●											●	●						●				
-North Friar's				●											●	●						●				
-Surrounding Slopes	●	●	●	●	●	●	●	●								●										
-Salt Pond																										●
CANOE BAY	●	●	●	●	●	●	●	●							●							●				

(2) Fleming Estate area, including:

Banana Bay  
 Cockleshell Bay  
 Mosquito Bay  
 Fleming Estate and Adjacent Valley  
 Surrounding Slopes

(3) Major's Bay area, including:

Major's Bay  
 Adjacent Valley  
 Surrounding Slopes

(4) Friar's Bay area, including:

South Friar's Bay  
 North Friar's Bay  
 Slopes north and south of Friar's Valley

(5) Canoe Bay area.

Immediate Great Salt Pond Area. The major natural feature of this portion of the SEP is the Great Salt Pond itself. It is surrounded by the IUZ but is itself a Conservation Zone/Special Management Area and addressed in Section 3.3 below and in Appendix H. Over 300 hundred acres, the pond gives the impression of a crater lake (which it may be), providing character to the immediate Salt Pond area and important scenic vistas from the surrounding slopes.

To the west, Little Salt Pond has been classified in the IUZ because of its small watershed and capacity for development as a marina with over 300 berths (see also Appendix H). The marina would be an integral part of the adjacent township and public jetty at White House Bay, scheduled to be the major entrance to the southern part of the Peninsula by land or sea. It is the only salt pond not formally designated a Special Management Area -- although once opened as a marina, it will nonetheless require careful environmental monitoring and management. To the northeast of the Great Salt Pond is Sand Bank Bay and adjacent lands, offering a prime site for one or two hotels. To the southwest, the frontal hills of the Nag's Head peninsula area (facing the Little and Great Salt Ponds) offer promising development sites.

Fleming Estate Area. This area contains the largest expanse of flat lands on the Peninsula. It offers scope for the building of a golf course, which would readily complement the potential for tourism development at Sand Bank, Mosquito, Cockleshell and Banana Bays. Two small hotels already exist at Cockleshell and Banana Bays, and owners of the northeastern portion of Mosquito Bay have expressed intention to build a 60-70 room hotel. The existing double salt pond inland of

Scotch Bonnet and Whale Back Hill also provides a possible, but marginally desirable alternative to the Little Salt Pond for development of a marina.

Residential development of all kinds could be accommodated in the flat areas as well as the slopes. The area could easily accommodate agricultural uses having links to tourism, particularly those of a high-tech nature (for example, hydroponics). Traditional farming is also a possible use, although limited due to anticipated escalating land values which are likely to render farming uncompetitive.

Major's Bay Area. A wide range of intensive uses could also occur on the flat areas and adjacent slopes of Major's Bay. However, its tourism potential is less than most other areas in the IUZ, primarily because the position of the Major's Bay pond immediately behind the beach leaves only a very narrow band of land for development of beach related facilities. The pond has some potential as a marina but is a more risky site than Little Salt Pond.

The lower slopes on the eastern portion of the adjacent valley, which are classified in the MUZ, are not well ventilated and are therefore less attractive as building sites than slopes in the immediate Great Salt Pond area and in certain parts of Fleming Estate. The steeper slopes on the west side of the pond and valley are more dramatic and better cooled but also are highly erodible, so building in that area should be done very discriminately and employing very strict soil and habitat conservation measures.

Friar's Bay Area. Owners of the land at Friar's Bay have already indicated their intention to construct one or two fairly large hotels. While Friar's Bay has two of the Peninsula's outstanding beaches, its fragile environment -- the major defence for which is the North and South Friar's Bay dune systems -- limits the scale and scope of development possible on the flat valley area without significant environmental alterations and risk of flooding during severe storms. In any development, major and permanent buildings should be restricted mainly to the lower slopes facing the lowland area. The slopes are, incidentally, well ventilated. An Environmental Impact Assessment study should precede approval of any development plans.

Canoe Bay. Canoe Bay is the only identified IUZ on the spine of the Peninsula. Access to it will be more difficult than all other IUZ areas. It is relatively small, but nevertheless could accommodate a medium size hotel or residential project. The lands sloping up from the Canoe Bay IUZ are classified within the LUZ, but would make fairly attractive residential building sites, at suitable densities, and would complement uses in the IUZ area.

### 3.2.2 Moderate Use Zone (MUZ)

Most of the land uses that can occur within the IUZ would also be allowed for the MUZ, with a few exceptions, i.e., urban uses and a

golf course. On the other hand, some recreation uses suitable for the MUZ and LUZ, such as hiking, camping, and hunting, are not expected to occur in the IUZ. Apart from these, the difference between the IUZ and MUZ lies mainly in the intensity of use, which is determined by density limits (see Table 3.5).

For example, 18 rooms/units and 36 beds per acre, respectively, are allowed in MUZ areas, while comparable figures for the IUZ are 35 and 70. Maximum unit/acre density for residences is 4 against 8 for the IUZ and site coverage for residences is 25% for MUZ areas and 50% for the IUZ.

The slope range of the MUZ is 20 - 35%, making building slightly more difficult and costly than in IUZ areas. Access to building sites is more restricted, and the environmental consequences linked to building homes, hotels, and roads are generally more severe. Unless appropriate measures are taken, erosion may be accelerated during construction, natural drainage may be impaired and soil conditions may not allow sewage wastes to be filtered without the threat of pollution (see Appendix E). Special standards for access and service road design, to minimize erosion and runoff borne sediment transport, should be required in this zone -- especially when slopes over 25% are encountered

### 3.2.3 Limited Use Zone (LUZ)

Most of the LUZ is land with slopes over 35%, which implies difficult and costly access, as well as very high building costs, perhaps 25% to 40% higher than building in flat areas. Building in LUZ areas with excessively steep slopes will present serious engineering and environmental management problems. Such areas are erosion prone and not readily conducive to sewage disposal by conventional means, i.e., septic tanks and soakaways.

For these reasons, tourism development is not recommended for the LUZ. Residential development for condominiums and other forms of cluster residential configurations should be carefully controlled by the special density criteria established for LUZ areas. Large-scale subdivisions should be discouraged. Apart from residences, building construction should be mainly confined to recreational uses, such as scenic lookout facilities.

The negative scenic or visual impact of all large structures, extensive clearing and access roads within LUZ areas will be readily discernable from vantage points on both land and sea. Therefore, land management should of necessity be very strict if scenic qualities, important to the attractiveness of the Peninsula, are to be maintained. Development control of LUZ areas should, among other things, seek to:

- protect highly erodible soils and seek to encourage forest regrowth through landscaping and reforestation;

- protect areas of outstanding natural beauty, e.g., the northern slopes of Sugar Loaf Hill;
- minimize impacts that diminish scenic quality;
- protect remaining stands of dry forest, e.g., Major's Bay; this should also apply to dry forest areas in the IUZ and MUZ (see Environmental Assessment Report).

### 3.3 Conservation Zones

#### 3.3.1 Links to Development

The spatial distribution and required conservation strategies for the unique physical, natural, and cultural features of the Southeast Peninsula were addressed extensively in the Environmental Assessment Report (Section 5.6). Those findings are incorporated here by reference as they shaped the design of the following Conservation Zone land use designations which provide for two zonal classifications.

- (1) Protected Areas (Nag's Head Wildlife Reserve)
- (2) Special Management Areas, which encompass a total of seven different subdivisions:
  - peaks (6)
  - salt ponds (5)
  - dunes (all)
  - beaches (all)
  - coastal waters (all)
  - marine habitats (3)
  - historical/archaeological sites (15).

Each resource grouping represents a Peninsula resource for which there exists a combination of intrinsic value plus threat from projected development impacts sufficient to warrant "special management" status and conservation oriented monitoring and controls.

The effective development and management of the various types of conservation zones constitutes a significant component of the overall land use strategy for the Southeast Peninsula. The task of managing such areas complements the style of tourism to be pursued on the Peninsula as it provides a setting for recreational amenities essential to the success of the tourism strategy. How this is to be done presents a major challenge that will require close collaboration between the public and private sectors.

### 3.3.2 Protected Areas

Although the EAR suggested several such possible areas, only one has survived the final Land Use Planning Team's screening process for strict reserve status, namely, the proposed Nag's Head Wildlife Reserve. This frigate bird and pelican nesting area on the southerly tip and southwesterly coast of the Nag's Head Peninsula comprises approximately 80 acres (see Land Use Map #3). Since it is privately owned land, it is fortunate that the owner has expressed an interest in seeing the area set aside as a wildlife reserve or park. This should be confirmed by a formal conservation easement arrangement as soon as possible. Monitoring requirements remain the same as specified in the EAR.

The three previously proposed "marine protected areas" (Friar's Bay, Guana Point and Major's Bay) have not been dropped altogether but shifted to Special Management Area status (see below). The proposed Canoe Bay reserve has been dropped based on reexamination of nesting data and because the new Fisheries Regulations include a moratorium on all turtle harvesting in St. Kitts and Nevis. Turtle nesting at Canoe, as at all the other sites identified in the EAR, should be monitored and protected by the Fisheries Unit.

At some later date, it may be necessary to provide "Protected Area" status to one or more of the sites, habitats or landscape features listed below under Special Management Areas, but such action is not necessary (or defensible) until more systematic research is undertaken.

### 3.3.3 Special Management Areas

Peaks - The pleasing visual effect that one encounters on the Southeast Peninsula draws upon the harmony of salt ponds, beaches, coastal indentations, and most of all upon the overwhelming shapes and configurations of its landscape. The major peaks, Timothy Hill, Salt Pond Hill, St. Anthony's Hill and Sugar Loaf Hill, are imposing and significant features of this landscape.

One important land management principle should be to protect the scenic effect of the whole by preserving the intrinsic value of the peaks in particular, maintaining their present undeveloped state. The integrity of the peaks could be guaranteed if only certain, non-intrusive recreational uses are permitted above an identified elevation. The recommended contour level (height above sea level) above which there should be no significant development is:

	<u>Easement Height</u>	<u>Easement Acreage</u> (approximate)
Timothy Hill	400 feet	35 acres
Salt Pond Hill	500 feet	125 acres
St. Anthony's Peak	600 feet	126 acres
Sugar Loaf Hill	300 feet	40 acres
Rock Hill	450 feet	4 acres
Long Hill	500 feet	10 acres
		<u>Total 340 acres</u>

The tops of many of the gracefully rounded hills have less than 20% slope -- even less than 10% -- and technically, using only the slope criterion, they qualify as high intensity use areas. However, road access would require extensive road building through steep terrain -- often greater than 35% slope.

In addition to protecting the major peaks, once the access road is built, it may be useful and possible to identify other selected areas of undisputed scenic beauty for "special management" status to help maintain the SEP as an outstanding tourist attraction. After a particular hotel is sited, for example, it could be determined that promontories or skylines visible from the hotel as sited should be protected. In this case, a conservation easement might be negotiated (with compensation if development rights are lost).

Ponds - There are approximately 430 acres of salt ponds on the Southeast Peninsula.

- Friar's Bay	5.6 acres
- Mosquito Bay	16.5 acres
- Cockleshell Bay	18.4 acres
- Great Salt Pond	309.5 acres
- Major's Bay	28.6 acres
- Little Salt Pond	52.5 acres

While the pond systems are technically included in the Limited Use Zones (LUZ), they also are sufficiently critical as wildlife habitats and sediment traps to warrant classification as Special Management Areas, requiring close monitoring, selective use and careful management. Specific use guidelines are provided in Appendix H (see also the EAR, Section 4.7). Additionally, a salt pond monitoring programme should be mounted by the proposed GSKN Environmental Management Unit and at the end of a two year cycle long-term management plans should be developed for each pond.

In its present state, the Great Salt Pond constitutes a major asset as is to adjacent real estate and land values and as is to the environment (functioning as a sediment trap and avian habitat). Under no circumstances should the Great Salt Pond be dredged or opened up.

With the possible exceptions of Artemia (brine shrimp) mariculture and benign recreational uses, it should be kept undeveloped.

In constructing the recommended ring road around the Great Salt Pond, a circumferential green belt of about 30 metres wide will be created as a buffer, open space and wildlife area suitable for wading birds and terns. Edges should be landscaped where necessary, but generally left in its natural state, remembering that pond boundaries vary from wet to dry seasons and over the years. Park land will enhance the area aesthetically and become a focal point for relaxation by area residents. Nothing should "interrupt" the view of the pond from its surrounding hills and vantage points. Its open expansive serenity is a "resource" to be protected for all to enjoy.

On the eastern side of the pond, the belt will give way to the existing wetland and bird habitat which is to remain in its natural state. On the southern side, a boardwalk could be constructed from the green belt to the small island that is situated in the pond as a wildlife "viewing platform."

Dunes and Beaches - See Appendix K and EAR, Section 2.3.

Coastal Waters - Although not so designated on the Land Use Maps which accompany this report, all coastal waters -- and especially those bay waters at the base of all major watersheds scheduled for road and facility development -- need to be classified as Special Management Areas and considered a Conservation Zone. Close monitoring of water quality, with well established antecedent base line data, must be undertaken, as outlined in the EAR, Section 5.7.

Marine Habitats - Three specific marine sites are, in effect, designated as Special Management Areas. In these particular cases, the sites represent submerged land use Conservation Zones. Because of the new Fisheries Regulations permitting the establishment of "closed" (management) areas (see Appendix C), this terminology is used for the the marine habitats.

(1) The concept for and area of a South Friar's Bay Marine Reserve, proposed in the EAR as a managed habitat for juvenile conch, has been changed in light of the new draft Fisheries Regulations. A larger area stretching from South Friar's Bay to Ft. Thomas Point is recommended as an area to be "closed" to conch fishing. It will be managed by the Fisheries Unit and subjected to continuing research regarding its efficacy and any needed boundary adjustments.

(2) The Guana Point Marine Reserve recommendation remains unchanged except that we suggest an immediate study of key water quality parameters (especially turbidity) so the area can be used as a base line in the programme for monitoring the erosion/sediment/run-off impacts from road construction activities on the Peninsula.

(3) The Major's Bay protected area recommendation has been changed to a "closed area" status, and we suggest that seining also be classified as a prohibited use while the area remains closed.

Historic and Archaeological Sites - The recommendations made in the EAR stand, but are supplemented by the following management recommendations:

(1) Formal "conservation easements" should be negotiated with the landowners for each site;

(2) All Environmental Impact Assessments submitted for projects on land parcels containing such sites as identified in the EAR must address the question of projected impacts upon and preservation strategies for these sites if they are situated in the same watershed as the proposed development project.

#### 3.3.4 Conservation Zone Management Alternatives

Some combination of concerned landowners, the GSKN Fisheries Unit and the Planning Office's projected Environmental Management Unit could conceivably, through cooperative division of effort, divide the responsibilities for monitoring and managing the wide spectrum of Conservation Zones listed above. This may be a way to start, but it will not work well in the absence of a trained and permanent cognizant national parks and recreation authority, backed by legislation and funding. One alternative, based on the new draft GSKN "national parks" legislation, is outlined in Appendix C (Section C.5). A second alternative, which combines park and protected area management with SEP public recreational area and facilities development and management, is structured as a not-for-profit, limited company. This alternative is discussed at the end of Section 3.6.

#### 3.4 Access Road Landscaping and Lookouts

Apart from its access and transportation value, the SEP road could emerge as an important scenic route, which can be substantially improved over time through selective roadside landscaping of areas where soil conditions permit such activity. Additionally, visitors could have greater visual appreciation of surrounding vistas at a number of strategic lookouts.

Site preparation and facility requirements for a lookout vary from one site to the next, although a prototype (see EAR, Figure 5.2) provides some suggestion of the type of facility along the main Peninsula road which might be built and the vista to be expected. Roadside scenic lookouts along the main road should be constructed and maintained by Government although cosmetic maintenance could be provided as a public service by local civic groups, the adjacent landowner or resort operator.

Among the off-road, large scenic lookout areas identified by the Land Use Planning Team, the highest priority for development should be given to the Timothy Hill and Grape Tree Bottom lookouts. These sites because of their income generating potential could be developed and operated as private sector enterprises. At the same time, each such site can add to the general public's enjoyment of the Peninsula as a recreational area.

As Figure 3.3 indicates, these lookouts are linked to the scenic roadway by secondary roads or trails. The Timothy Hill site is owned partly by the Frigate Bay Development Corporation (FBDC) and partly by private landholders. If, following an appropriate feasibility study, the FBDC elects to develop the site as a scenic lookout, it is recommended that the facilities provided include a small recreation park, a restaurant/ snack bar, paid telescopes mounted at lookout platforms to allow viewing in all directions, a rain/sun shelter, picnic area and parking at a lower level. All building rooflines should be low, discrete earth-tone colors used, and the entire facility more or less invisible to a distant observer viewing the scenic Peninsula skyline and hill tops from a mile or more away.

The Grape Tree Bottom lookout could also be developed with an appropriate size restaurant, designed to take advantage of the outstanding views offered by the site. A gift shop might also be planned as part of the facility, depending on the anticipated level of patronage. This site should be one of the "way stations" on the proposed hiking trail network.

Lastly, a tree and plant nursery should be started when the road construction commences and a suitable re-vegetation/landscaping plan developed. Additionally, as recommended in the EAR, previously denuded/damaged areas should be scheduled for inclusion in a re-forestation plan and programme as soon as possible.

### 3.5 Demand and Design Factors

#### 3.5.1 Tourism

The potential for tourism on the Southeast Peninsula is far in excess of what is assumed or projected in both the "Early Development" and "Manageable Growth" scenarios presented in Appendix A of this report, i.e., 2040 rooms/units and 1294 rooms/units, respectively, in 20 years. The challenge is to realise a style of tourism that complements both the natural and cultural environment. This can partly be achieved by enforcing building guidelines on density, height, setback and even lot size. However, building style, colour and other more aesthetic characteristics are more difficult to influence, as are design measures to save energy and water, to reduce construction phase impacts and to encourage inconspicuousness. Nevertheless, such efforts are and should be required since the overall goal is to achieve an integrated development design in harmony with the Peninsula's u-

nique ecology. Examples of such environmental styling are few in the region, but they are widely acclaimed internationally and boast high occupancies and repeat business.

### 3.5.2 Residential Demand

It is assumed that residential development will include condominiums, other cluster type developments such as apartments, subdivisions (multiple lots with individual residences) and single lot (mostly large) residences. Most types of residential development can occur in all zones, the exception being that larger subdivisions should not be allowed in the LUZ. Density levels, however, will vary from zone to zone.

Based on the experience of Frigate Bay, there will be a demand for second homes, mainly expatriate-owned, and first homes for upper middle class Kittitians, the latter built on 1/4 to 1/2 acre lots. Even without such experience, it is reasonable to assume that residential condominiums and middle income apartments targeted to belongers and non-belonger residents will surface on the real estate market within the next 20 or maybe 10 years.

Also, because of the size of the Peninsula and as a consequence of its multiple ownership, the market is also likely to target, within the IUZ, clients seeking building lots between 4,000 and 7,000 sq. ft., similar to those of Bird Rock, Harbour View and Suncrest. On the other hand, there will be a demand for fairly expensive residences, requiring lots upwards of 1/2 acre in all zones, but eventually more so in the MUZ and LUZ.

Initially, the largest demand may be for residential lots between 1/4 and 1/2 acre; hence, the development control authority can expect to review a relatively large number of subdivision applications in the early stages of the Peninsula's development. It should insist that subdivision planning be based on sound slope and contour analysis and that road construction meets erosion reduction standards. It should also ensure that adequate provisions are made to reserve open space, equivalent to about five percent of the subdivision's total land area, exclusively for youth recreation and other public purposes such as a community centre or community garden, as desired.

Conscientious development control and permitting procedures can minimize the potential conflict engendered by juxtaposed siting of high to medium density residential and tourism development projects. Furthermore, the promulgation of clear and practical building and facility design aids, standards, and guidelines will reduce the inevitable conflicts which occur when costly application documents are rejected and sent back for re-design. Lastly, and ideally, GSKN and SEP landowners should jointly commission an SEP design and marketing plan aimed at establishing a consensus on the complex issue of style, theme, market targets and standards.

### 3.6 Recreation Uses

#### 3.6.1 Recreational Demands

Recreational activity -- formal and informal, scheduled and unscheduled, by both visitors and residents -- will place extraordinary demands on the natural resource base in all zones of the Southeast Peninsula, long before the first SEP hotel is finished. This will happen in an unregulated and damaging way if proper controls are not put in place. A list of needed controls was provided in the "Recreation" section (4.2) of the Environmental Assessment Report. The following sections of this Plan provide supplementary recreational land use guidelines in somewhat more detail. Figure 3.3 is a graphic presentation of projected recreation uses and facilities siting recommendations.

Recreation will constitute a major land use on the Southeast Peninsula since the area's resources provide a wide range of such opportunities, e.g., beach leisure, water sports, scenic and wildlife appreciation, hunting, hiking, horseback riding, golf and tennis. The Peninsula's public recreational potential, however, will not be fully realized if its development is predicated solely on the incentives supplied by the market place. Comprehensive land use planning, linked to appropriate levels of Government intervention, investment and management, is required to ensure that public recreational opportunities in particular are developed.

#### 3.6.2 Beach Recreation

With construction of the Southeast Peninsula road, the full potential of the area's beaches for resident and tourist use can be realized in the near future. The less protected Atlantic windward beaches, however, will be less patronized than the more comfortable beaches of the leeward or Caribbean side. For example, because of the location of South Friar's Bay at the base of the Peninsula and the quality of its beach, a relatively high level of use can be expected, in part as a natural spill-over from existing activity at South Frigate Bay. Although North Friar's Bay on the Atlantic side is too exposed to attract large numbers of residents and tourists on any consistent basis, the Friar's Bay area as a complex is still likely to become the first major beach recreational node on the Peninsula.

The SEP Environmental Assessment Report identified 21 beaches on the Peninsula and classified them as consisting of sand, boulders, shingle, cobbles or a combination of the identified beach materials. Ten of the beaches, mostly of sand composition, are classified as having medium to high potential for tourism and hence public recreation. Herein lies the basis for potential land use conflict -- a dilemma for Government and developer alike: obviously, beaches with high tourism potential are those most likely to be developed for that market, but unless such sites are carefully developed and monitored, public recreational opportunities could be minimized or even lost. Particular

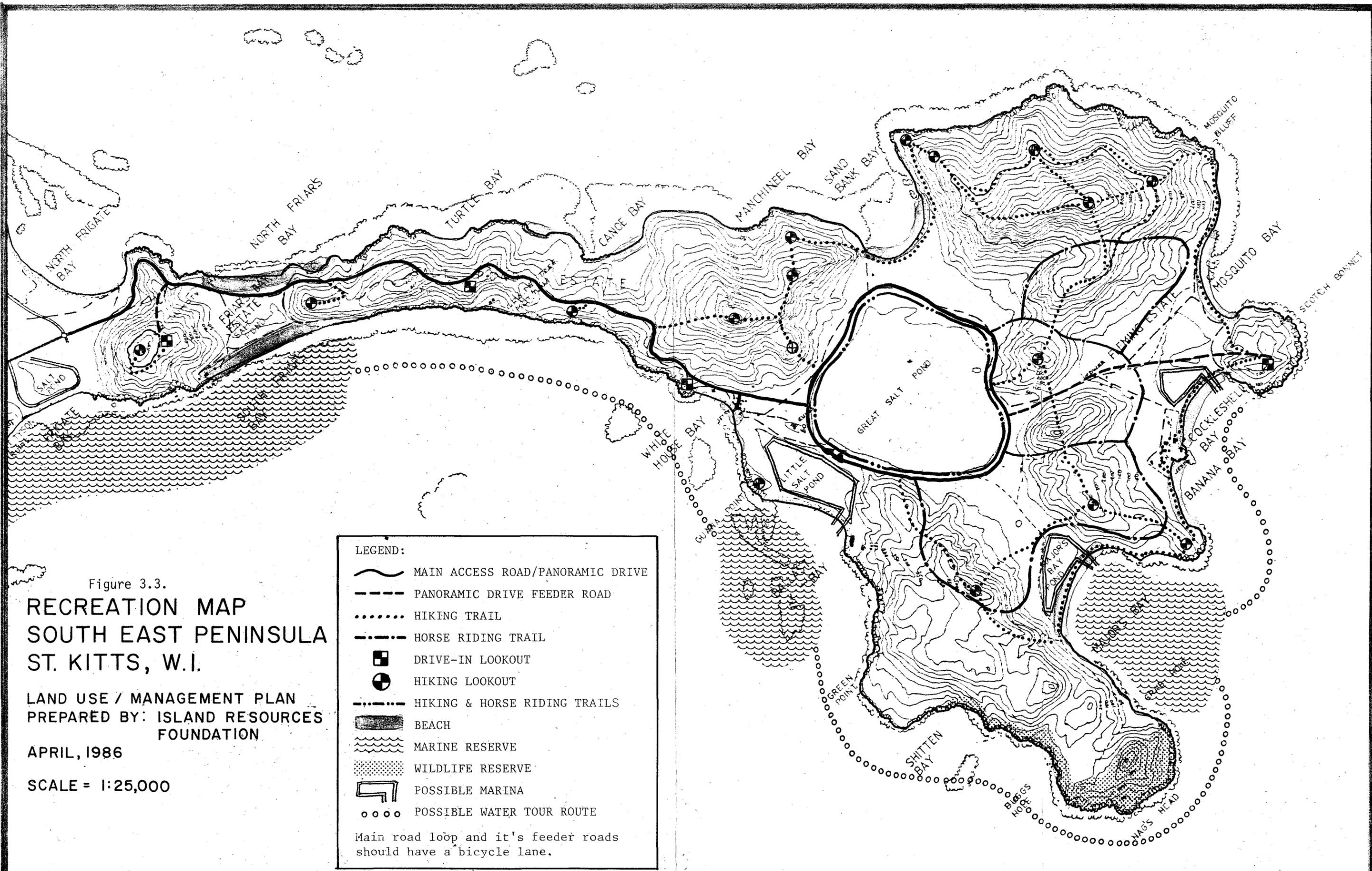


Figure 3.3.  
**RECREATION MAP**  
**SOUTH EAST PENINSULA**  
**ST. KITTS, W.I.**  
 LAND USE / MANAGEMENT PLAN  
 PREPARED BY: ISLAND RESOURCES  
 FOUNDATION  
 APRIL, 1986  
 SCALE = 1:25,000

**LEGEND:**

-  MAIN ACCESS ROAD/PANORAMIC DRIVE
-  PANORAMIC DRIVE FEEDER ROAD
-  HIKING TRAIL
-  HORSE RIDING TRAIL
-  DRIVE-IN LOOKOUT
-  HIKING LOOKOUT
-  HIKING & HORSE RIDING TRAILS
-  BEACH
-  MARINE RESERVE
-  WILDLIFE RESERVE
-  POSSIBLE MARINA
-  POSSIBLE WATER TOUR ROUTE

Main road loop and it's feeder roads should have a bicycle lane.

attention must be paid to the development of lands adjoining the more outstanding or "high potential" beaches, two of which are already partially developed and all of which are the subject of preliminary development plans or concepts, e.g., South Friar's and North Friar's White House, Sand Bank, Mosquito, Banana, Cockleshell and Major's Bay.

It is recommended elsewhere in this study that the White House Bay area be developed as a township, with appropriate coastal amenities and attractions for public enjoyment. Since Government is expected to acquire land to accommodate required public services there, (e.g., a jetty, parking, dock master's office, a customs and immigration building, etc.), it is recommended that Government also consider acquiring sufficient adjoining lands at White House beach to permit the future development of a recreational/commercial park, complete with snack, gift and craft shops, a visitors centre, a promenade network, and changing rooms to enhance public use of the beach area.

### 3.6.3 Management Controls for Beach Areas

The Beach Control Act of 1961 (see Appendix C) gives Government the authority to (a) issue licences for the use of the seabed and foreshore (the latter implying the inter-tidal zone), (b) control development in lands adjoining the foreshore up to 50 yards from the high water mark (HWM), or (c) to acquire such lands where necessary for public purposes. Government's exercise of development control as expressed in this legislation will allow lands adjoining beach areas to remain in private ownership, while limiting land use practices which would damage the area and restrict the level of public recreation at Peninsula beaches. The alternative - direct land acquisition by Government - carries with it a substantial price tag, not only for purchase but for the recurring costs associated with development and maintenance.

Licences and Fees for Use of the Foreshore and Seabed. The authority under the Beach Control Act for licencing should be strictly enforced to avoid adverse environmental impacts and any foreclosing of recreational opportunities. Dredging or any other seabed changes to facilitate marine tourism, private dock construction, and even sea defence measures (especially sea walls, groynes, gabions and jetties) should be subject to careful scrutiny, the impact assessment requirement, to licensing, and to seabed or beach area "Crown land" annual lease payments if revenue is generated or exclusive use claimed. Private sector construction of truly public facilities, however, should be encouraged, but design approval should still reside in Government. Sand mining from all beaches and berms should be absolutely prohibited (provisions are made elsewhere in this Plan for access to dune sand; see Appendices K and C).

While the authority to issue licences has been given to Government under the Beach Ordinance, as stated in Appendix C rules and regulations have not been drafted by Government to clearly define control, monitoring, and enforcement procedures. These regulations, including

the procedure for the issuing of licences for activity in the foreshore or seabed, should be promulgated prior to commencement of building activities on the Peninsula.

Guidelines for Developing Adjoining Lands. Public use of the foreshore, or what is commonly called the "beach," should not be compromised by misuse of adjacent land areas. Adherence to the guidelines which follow will provide a framework for reducing the risk of ill-advised resource allocation and inappropriate uses of back-beach areas:

(1) Building Setback Restrictions. It is recommended that major and permanent structures should not be built in the 50-yard zone defined by the Beach Act as "adjoining lands." In some cases, it may be necessary to extend this zone to 100 or even 200 yards inland to incorporate and protect barrier dune systems, e.g., at North Friar's and Sand Bank Bays. In other words, the minimum width of the setback zone is 50 yards but may be expanded upward (inland) to reflect geologic, topographic and environmental factors at any given beach. Within this zone non-permanent or non-residential, low profile, semi-permanent structures such as restaurants, bars, change rooms, and watersports facilities, serving both hotel guests and the public, can be allowed at a discretionary setback established by the permitting authority. Apart from the value of such restrictions in ensuring public access to beach recreational areas, setback requirements help to reduce the need for costly sea defence measures in the future to protect man-made structures when beach size has been eroded due to storm-wave action. More detailed setback guidelines are provided in Appendix K, and recommended setback control areas are displayed for key beach areas on SEP land use maps, sheets #1, 2, and 3 attached to this report.

(2) Infrastructure/Amenities. Developers of adjoining lands should make adequate provisions for "customary" beach-associated infrastructure. As a minimum, access to toilets and provision for the placement and servicing of litter containers for public use should be required, as should elevated wooden walkways and steps over steep dune areas limiting access to the public. The cost of such amenities can readily be offset by revenues from restaurants, bars, small craft rentals or other beach-related enterprises controlled by the developer. Change rooms could be encouraged depending on the size of the development and the likelihood of recouping operational costs from income generated by other beach-related facilities.

(3) Public Access and Parking. Beach access for the public should be an integral component of all development projects which include beach waterfront property. A minimum public right-of-way to beaches of 12 feet suitable for vehicular traffic should be required to the landward edge of the beach berm and/or dune area. Vehicular traffic, including motor cycles, should be prohibited under all circumstances on the beaches themselves and on their associated berm and dune systems. Dunes should not be breached, and stabilizing dune vege-

tation should not be removed. Marked access paths should be laid out in such a way that it is not inconvenient to public beach users or disruptive of the relative privacy sought by hotel residents.

Public parking facilities for non-tourist beach users should be required as a component of development plans which incorporate beach areas. Such parking areas should be convenient to the access path or route to the beach. Parking capacity should be based on anticipated level of use, which is determined by the location, quality and size of the beach, along with the volume of traffic expected by public serving facilities. Public parking along the sides of access roads should not be permitted.

#### 3.6.4 Hiking and Horseback Riding

Figure 3.3 designates possible hiking and horseback riding networks, and Appendix N treats this subject in rather more detail. Hiking to the peaks of Salt Pond Hill and St. Anthony's Peak in particular should provide interesting recreational challenges to enterprising persons. Once reached, the peaks provide exceptional views. Building above elevations specified in this plan should be prohibited in order to ensure that landscapes are maintained in a natural state and intrinsic scenic values are not diminished.

Horseback riding needs to be restricted to flat areas and gentle slopes, and, therefore, the spine of the Peninsula is not suitable to this activity. It would be too dangerous. The flatter lands and rolling hills around the Great Salt Pond and in Fleming's Estate are far more appropriate.

For human safety and environmental reasons, trails should not be constructed on excessively steep slopes or environmentally sensitive areas, such as beach dunes. The simultaneous use of a trail for hiking and horseback riding should also be avoided because of the potential conflicts as well as risks to participants present in such dual use activities.

The major hindrance to the implementation of hiking and riding trails is the existing pattern of land tenure. Trails would of necessity traverse several and differently owned properties. As holdings become subdivided, trail use will become further encumbered unless easements are obtained from the affected parcel owners. Government planners and landowners should negotiate an agreement for a "right-of-way" for trails and confirm it by use of easements. This should be done before development activities begin on the Peninsula and barriers are raised to the laying out of such trails. Use of the vehicular road should be limited to crossings as required.

#### 3.6.5 Other Land-Based Recreation

Most of the other forms of land-based recreation will fall within the jurisdiction of private developers. Hotels and in some

cases homes will have tennis courts and swimming pools erected. Residential development may at some point justify the creation of a racquet club. Suitable land exists, particularly in Fleming Estate, to allow for development of a golf course, although this may not be economically feasible based on the allegedly poor financial return of the Frigate Bay course. A top-quality golf course would naturally be a desirable amenity, and it would enhance any tourist marketing strategy aimed at up-scale executive conference and small convention targets. Tennis courts are essential but require excellent drainage and regular maintenance.

Historically, the practice of trapping monkeys and hunting deer and birds (in season) is popular both as a form of local livelihood and sport. However, its potential as a form of recreation for visiting tourists is rather limited and should not be encouraged. In fact, the Government and landowners should attempt to reach a consensus with hunting groups to phase out all hunting on the Peninsula, except when required as a wildlife management tool. At some point in the near future, the Government of St. Kitts and Nevis should create and fill an establishment position of "wildlife specialist" either within the Forestry Department or the proposed Environmental Management Unit. An alternative would be to add wildlife management to the Fisheries Unit, renamed as the "Fish and Wildlife Unit".

#### 3.6.6 Marine Recreation

The potential for marine recreation activities associated with the Southeast Peninsula will be realised principally through initiatives of the private sector. With the few exceptions cited below, Government's role will be limited to ensuring that the environmental quality of the resources upon which recreational demand depends is maintained through effective resource management. As the Peninsula develops, conflicts between competing marine uses will intensify, and it will become increasingly difficult, for example, to protect important fisheries resources such as the juvenile conch and lobster nursery areas of South Friar's Bay and Major's Bay against anticipated impacts from yachting activity.

Water skiing areas should be buoyed to protect swimmers, divers and snorkelers. Small craft sailing near the coast may be enhanced by designating specific yacht anchoring areas where permanent moorings could be used if the anchorage is safe enough for overnighting. The establishment of permanent moorings is a management tool that permits efficient use of water space and minimizes the detrimental impact of anchor placement on fishery habitats. It, therefore, offers good possibilities for use in areas such as White House and Major's Bays.

Development proposals requiring the installation of marine infrastructure, such as marinas, docks, ramps, pipelines, jetties and breakwaters -- all requiring alterations of the seabed -- should be evaluated in light of marine resource management objectives identified by the GSKN. Management plans must of necessity be devised and imple-

mented for areas where use conflicts are likely. These should be continually updated in light of experience.

For example, SCUBA diving in adjacent Peninsula waters will increase, spurred by the growth in tourist arrivals. Existing SCUBA dive tour operators will expand their capacities, and new dive terminals will emerge as integral components of hotel complexes or as separate facilities. Such activities must be accommodated on adjoining beach lands in a way that will not limit other forms of beach recreation.

In addition, the attractiveness of the Southeast Peninsula's leeward coast for wind surfing, other small craft sailing, snorkeling, water skiing and paddle boating suggests that eventually a number of water sports centres could emerge. Whether devised as part of hotel complexes or done in conjunction with marina operations, the implications for the siting of facilities and management of resources are the same. For a more detailed discussion of marinas and water dependent uses, see Appendix H.

### 3.6.7 Spearfishing and Marine Specimen Collecting

The nearshore marine resources of St. Kitts and Nevis are limited. Because they may be easily overexploited, they cannot support increased fishing effort. For this reason alone, increased spearfishing activity is undesirable. In addition, larger fishes have been shown to disappear from reefs subjected to spearfishing. This disturbs the natural balance between predator and prey fishes and may lead to proliferation of algal mats which smother reef-building corals (discussed in greater detail in Technical Appendix G).

Because of the impact on larger fishes, spearfishing also interferes with other recreational activities such as snorkelling, SCUBA diving, or underwater photography which derive a large part of their appeal from the presence of visible and relatively tame fishes. It is likely that fewer tourists will engage in spearfishing than in snorkelling, diving, or other types of recreational fishing. A substantial increase in spearfishing activity would thus deny the benefits of these resources to the larger public in favor of a small fraction of the population -- in this case, that portion which actually engages in spearfishing.

Because it is not extensive at present, restriction of local spearfishing is not recommended at this time, except that no spearfishing should be permitted in any protected areas as designated under the draft Fisheries Regulations. Import or use of spearguns by non-national visiting tourists, however, should be prohibited. In addition, renting, using, or promoting the use of spearguns for financial gain or prizes (as in the case of spearfishing contests) should also be prohibited.

Ornamental fishes, hard corals, soft (precious) corals, shelled mollusks, and other echinoderms are all collected in other areas of the

Caribbean for local tourist trade or export. A limited harvest of selected species will probably have little negative impact, but all of these resources are of limited extent and consequently subject to easy overexploitation. The draft Fishery Regulations for St. Kitts and Nevis provide adequate legal protection for ornamental fishes and corals, and it is suggested that this be extended to shelled mollusks and echinoderms as well. Resource management plans should be developed for these species, and it is recommended that no harvest of soft corals, shelled mollusks (other than conch) or echinoderms for local sale or export be permitted until such plans are available. No harvest of hard corals should be permitted for any purpose until the relevant management plan is prepared. There are good prospects for culturing many species of fish, mollusks, and echinoderms, and this deserves further investigation as a local export industry.

For further details on spearfishing, specimen collecting, fisheries management and related issues, see Appendix G of this report and the antecedent EAR document, Sections 2.3, 2.4, and 5.7.

### 3.6.8 Merging Recreation and Natural Area Management: A Concept

As noted in Section 3.3 there are close linkages between the need for well operated public recreation facilities and the need for sound management of key natural ("Special Management") areas used for recreation on the Southeast Peninsula. Since both need funding, the possibilities of revenue generation from commercial enterprises established at the various recreational sites leads to an obvious conclusion: namely, the establishment of an appropriate management framework. One can envision a collaborative private and public sector venture, essentially a not-for-profit or limited company with recreation facilities and natural area management responsibilities and with the authority to seek grant funding, borrow money, assess fees, buy or lease property, negotiate recreational facility and service concessions, collect rents, etc.

This Southeast Peninsula Parks and Recreation Authority (SEPPRA) -- with a Board of Directors drawn from both the public and private sectors selected to balance conservation, recreation and business interests -- would be given the authority to and be responsible for managing:

1. All (or some) SEP beaches, including the erection and maintenance of public facilities, as defined by the Beach Control Ordinance; it would acquire, plan, implement and manage the proposed White House Bay beach recreation/commercial park;
2. Public hiking and possibly riding trails, as acquired through easements or other measures (outlined in Appendix N);
3. Public scenic look-outs (for example, SEPPRA could acquire the lands for the development of the Timothy Hill Look-out and develop the project as proposed in Section 3.4);

4. The proposed Nag's Head Wildlife Reserve and possibly the Guana Point Marine Park;
5. The Great Salt Pond "Green Belt and Public/Wildlife Park"; the landscaping, construction of park furniture and other implementation costs could be funded by a request to a donor agency after the land had been entrusted to SEPPRA via easement or other measures;
6. Public dock, visitors centre, parking lots;
7. Salt ponds; SEPPRA's role in respect of salt ponds would primarily be to review and advise on applications for development and use of salt ponds and to monitor such uses;
8. Peaks;
9. Wildlife, in general.

In addition, SEPPRA could be given the responsibility for managing leases of the Southeast Peninsula seabed. Conceptually, income derived from projects at White House Bay and Timothy Hill could be used to cover its operating costs and particularly to subsidize non-income generating activities, such as trail management. In practice, this will take time and to a large extent would depend on the rate of progress made in development of the Peninsula in general. The White House Bay project, for example, would require some 5-10 years before significant returns can be expected. Initially, therefore, SEPPRA's activities will require external financial support.

It is recommended that a SEPPRA-like mechanism be evaluated, defined, authorised and launched as soon as possible in order to begin the search for the technical and financial support needed to build its capacity. With such assistance in hand, it could set about the execution of a number of critical tasks, including:

- (a) elaboration of recreation plans for the Peninsula, complete with preliminary concepts, designs and costing of projects;
- (b) assistance to GSKN to negotiate for acquisition of or easement access to lands needed for projects it might manage at White House Bay, Timothy Hill, and Nag's Head; the Authority could also assist with negotiations related to the development of trails;
- (c) review and monitoring of beach development projects by SEP developers to ensure adequate provisions are made for beach conservation and public beach recreation;
- (d) coordination of planning for and implementation of the Nag's Head Wildlife Reserve and design of a scheme for the management of SEP wildlife in general;

(e) planning and implementation of historical/archaeological sites management as recommended in the EAR.

All these tasks require time, technical support and financial resources. However, if implementation of the Land Use Management Plan for the Southeast Peninsula is to be effective, time is of the essence. SEPPRA's best chance to secure funding for the above tasks is to seek grant support from agencies such as CIDA, which in past years has shown an interest in funding protected area conservation for development projects. Antigua's National Parks Authority, with a strong business component built into its mandate, recently attracted a multi-million (Canadian) dollar grant to launch a large-scale version of SEPPRA.

At the very least, the proposed Southeast Peninsula Development Board should consider the concept an early agenda item and schedule it for a proper review and evaluation. The intriguing aspect of the approach is its blending of public and private sector skills and expertise in an ingenious format -- flexible yet responsible, comprehensive yet functionally focussed.

#### 4. SUMMARY OF ECONOMIC CONSIDERATIONS

Appendix A reports in detail on the economic analyses performed for the Land Use Management Plan. In the context of reasonable development options for St. Kitts, tourism produces potentially higher economic returns than any other industry. Therefore, our studies have focussed on development alternatives within the tourism sector. In addition, the high cost of land, the rugged terrain and poor soil, and the scarcity of water on the Southeast Peninsula preclude land-intensive development options, such as farming or forestry. Finally, the size of the Peninsula and the flexibility of the recommended Land Use Management process would not preclude establishing many kinds of specialized business activities on the Peninsula, even though tourism will characterize the area in economic and political terms.

##### 4.1 Socio-Economic Setting

Small size and slow growth are the dominating characteristics of the economy of St. Kitts and Nevis. Generations of emigration by the most economically and demographically productive portions of the population have resulted in a population base which has a slow natural growth rate. This is advantageous to development planners because it means that new job opportunities in emerging economic sectors like manufacturing and tourism can be used to absorb workers being dropped from sugar and other declining job sectors.

However, small size and slow growth are handicaps in coping with rapid rates of change. St. Kitts faces just such a dilemma from rapid growth of tourism after the opening of the Southeast Peninsula. Within ten years, it is projected there would be a tenfold increase in tourism, resulting from continued development of Frigate Bay and an average 100-room-per-year rate of new hotel construction in the Southeast Peninsula. Figure 4.1 compares the rate of increase in the St. Kitts and Nevis labour force with the increase in tourist-related service and construction jobs over a twenty year period.

While the labour force is increasing about one-and-one-half percent per year, this scenario (based on the "Early Development" Model presented in Appendix A) shows tourism jobs increasing at an overall compound rate of nine percent per annum for twenty years. For the first ten years the compound growth rate is in excess of 15% per year. This condition would result in immigration and inflationary wage increases which would produce major political problems for Government as well as seriously jeopardize the fragile economics of private tourism investment in the Southeast Peninsula.

This example shows the growth in tourism jobs over the twenty year period to be substantially greater than the total growth in the labour force (6,000+ jobs versus 5,000 new members in the labour force). Moreover, because of resource competition, this scenario would seriously damage prospects for the orderly expansion of other non-tourist

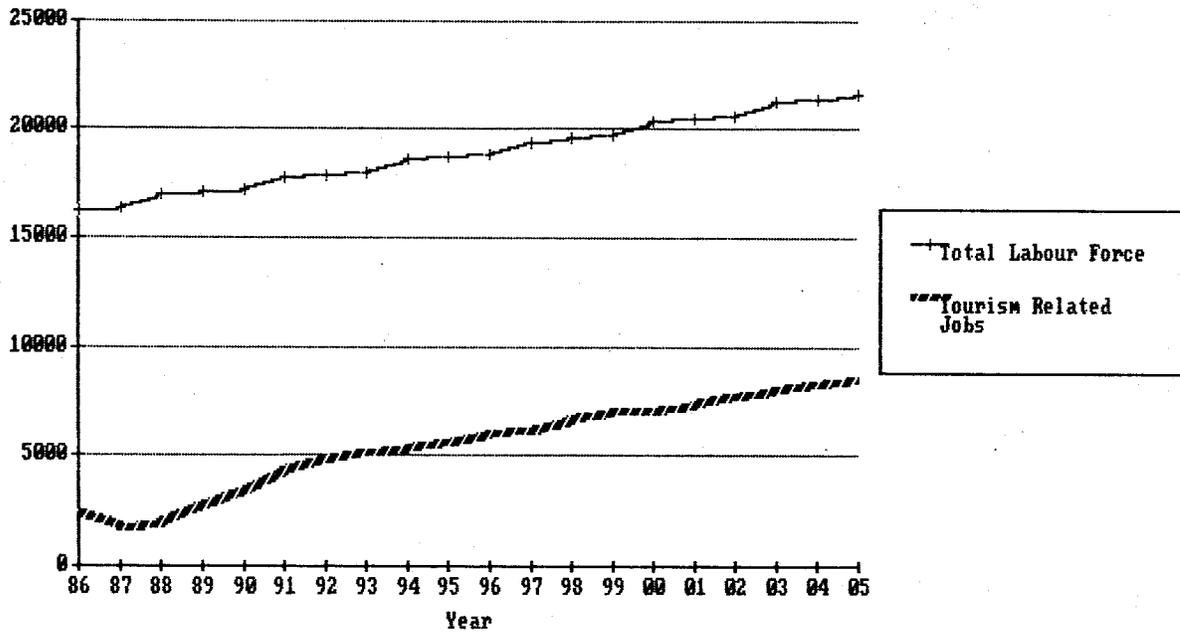


Figure 4.1. Comparison of labour force growth and tourism job projections over a 20 year period.

sectors, threaten Government's balanced diversification programme in the short run and weaken efforts in the longer term to reduce external dependence and provide physical and social infrastructure.

A rapid rate of tourism growth will also require a larger portion of the total new investment in St. Kitts to come from foreign sources. It is assumed that this is less desirable than increasing the local share of ownership in new plant and facilities from retained earnings.

In recognition of the socio-economic consequences of overly rapid development, it is recommended that public policy goals seek an overall rate of tourism growth of eight percent per year over the twenty year forecast period. The dangers of boom-and-bust investment cycles are especially great during early years after the opening of the Southeast Peninsula. (The reader is referred to Appendix A for a full review of the economic analysis developed by the IRF/LUMP team.)

#### 4.2 Constraints/Assumptions

A sustainable development scenario for the Southeast Peninsula must simultaneously satisfy five major criteria. Economic activity must be sufficiently rapid to (1) insure hotel profitability, and (2) recoup the costs of infrastructure construction and maintenance. But, development must not outpace (3) the capacity of the environment for renewal, (4) the local labour force, and (5) the level of tourist demand

St. Kitts and Nevis can reasonably expect from the competitive world tourism market.

To develop models of potential tourism growth as a result of the opening of the Southeast Peninsula, the historic and projected performance of the tourism sector throughout the Eastern Caribbean and specifically in St. Kitts and Nevis was examined (see Appendix A). In general, the lack of potential tourists is not felt to be an overwhelming problem, in part because of the small market share which St. Kitts would require.

The analysis of costs and earnings for various hotel and resort configurations shows that tourism-based development in the Southeast Peninsula must perform substantially above current regional averages in order to be attractive to potential investors or developers. Based on conservative assumptions regarding construction and operating costs, occupancy levels, and room rates and other revenues, the economics of private investment in hotel and resort facilities in the Southeast Peninsula appear marginal. It will require imaginative and tough-minded investors developing quality facilities with better than average cost control, marketing strategies, and occupancy levels and working with active support and encouragement from Government to make a commercial success of new tourist facilities in the Southeast Peninsula.

#### 4.2.1 A Note on the Pace of Development

Conversations with St. Kitts and Nevis officials, recent lessons from nearby islands, and a variety of tourism impact studies suggest that the scope and pace of tourism development, particularly for small modernizing islands in transition like St. Kitts and Nevis, should be carefully confined and gradual.

With incrementally phased tourism development, the host population is more likely to benefit from the process and adjust easily to new technologies, expectations and opportunities. The same principle applies to the environment since more time is allowed to observe and compensate for unforeseen adverse impacts.

This adaptive approach requires a committed public policy endorsement and an integrated management strategy to avoid the numerous dysfunctions associated with the proliferation of massive facilities in small and fragile, emerging island destinations, where ironically the pressures for the popular but ephemeral quick economic fix are deeply embedded and powerful.

Some of the more damaging effects of accelerated, intrusive tourism growth are:

- (1) The wholesale redeployment of capital, labour and land from low-income traditional pursuits like agriculture and fisheries to higher-wage hotels, service and transport opportunities yielding only

marginal GDP gains, no net employment creations, and irreversible ecosystem disturbances;

(2) Widespread real estate inflation which increasingly alienates lower and middle income groups from effective home ownership, which distorts land use patterns away from production and commerce toward speculation and tax sheltering, and which also, through rising rental premiums, affects the prices of wage goods, the residential cost of living and eventually the Government deficit;

(3) The loss of domestic smaller-scale food, service and raw materials tourism linkages because oversized accommodations, package tours and mass volume business are most easily and quickly captured by large-scale overseas suppliers before local production and marketing arrangements materialize; and

(4) Finally, intense tourism in small islands like St. Thomas and Nassau spawns irritating urban congestion and infrastructure breakdowns which have economic costs and may even deflect, re-route or prevent traditional shopping habits and work patterns.

These sectoral economic problems are made worse by broader macro-economic impacts stemming from unbridled growth. These include: (1) the seasonal distortions and productivity losses introduced by cyclically over- and then under-using capital capacity and labour; (2) declining self-reliance and escalating import dependence with strongly negative effects on the balance of payments; (3) potential damage to community saving and capital formation because of the purported influence of the demonstration effect, i.e., the local assimilation of affluent North American and European high-spending patterns. These economic effects are often accompanied by the crass commercialization that can overtake the measured pace of island life, as well as other potential types of cultural pollution that characterize fast-paced tourism in its most virulent, unregulated form.

In an insular microstate, like St. Kitts and Nevis, the practice of gradualism with a preference for small-scale design not only avoids the pitfalls of exploitative tourism but also embraces the long-term perspective necessary to achieve sustainability. Though there are as yet few quantitative guidelines specifying facility size, construction pace and visitor densities that will both guarantee economic profitability and ensure benign social absorption and ecological preservation, the St. Kitts and Nevis experience provides several justifications for a cautious, measured future tourism strategy. These include the time required for local planners to gain expertise for delicately integrating tourism development to minimize environmental disequilibrium and to maximize domestic economic linkages. A slow pace will also allow appropriate labour force training, on the job experience and the organic growth of a service tradition, particularly during St. Kitts and Nevis' difficult transition away from sugar monoculture. Finally, the gradual evolution of tourism should permit the gestation

of local entrepreneurship, the hallmark of an island community's long-term economic and social viability.

One nearby island has a draft tourism policy statement on the "scope and pace of development" that is an instructive model:

- (a) The pace of development will be carefully monitored to avoid excess capacity, and a limit will be placed on the size of individual hotels and/or villa/apartment complexes to ensure that smaller personalised hotels are created in keeping with the island's up-market image. These hotels will be low rise in character, and not more than three floors (including the ground floor) high. The maximum number of rooms in any one development will in future be limited to 75, and the limit of rooms anticipated in the island by 1990 will be 750.
- (b) Government is pledged to ensure that the scope and pace of development does not exceed the absorption capacity of the society, nor the ability of society to respond and adjust. The ultimate aim, through careful manpower planning, is towards full employment ....

#### 4.3 Findings

The economic analysis of the Land Use Management Plan for the Southeast Peninsula echoes the findings of previous development studies for the area, i.e., it is not difficult for Government to find economically viable reasons to support the investment.

The seven percent hotel tax is a powerful revenue producer under all reasonable projections of tourism growth which include the opening of the Southeast Peninsula. When added to the departure tax and the indirect taxes which would arise from increased economic activity, adequate revenues are available to finance essential public capital investments and service needs.

Figure 4.2 below shows tax receipts as projected under the Manageable Growth scenario outlined in Appendix A and public sector costs for a road and water system under the highest cost options. Total tax revenues exceed total road and water expenditures by the ninth year. Under less conservative assumptions, this crossover point can occur as early as the seventh year. Calculations of tax collections, especially the hotel tax, assume there is a relatively high degree of compliance with reporting and payment requirements.

We recommend investigating the potential benefits of a government subsidy to private investors through the use of government guarantees or bonding authority to provide capital investment funds at rates below private bank rates. Capital costs to resort developers on the Southeast Peninsula will be unusually high, because the banks will charge

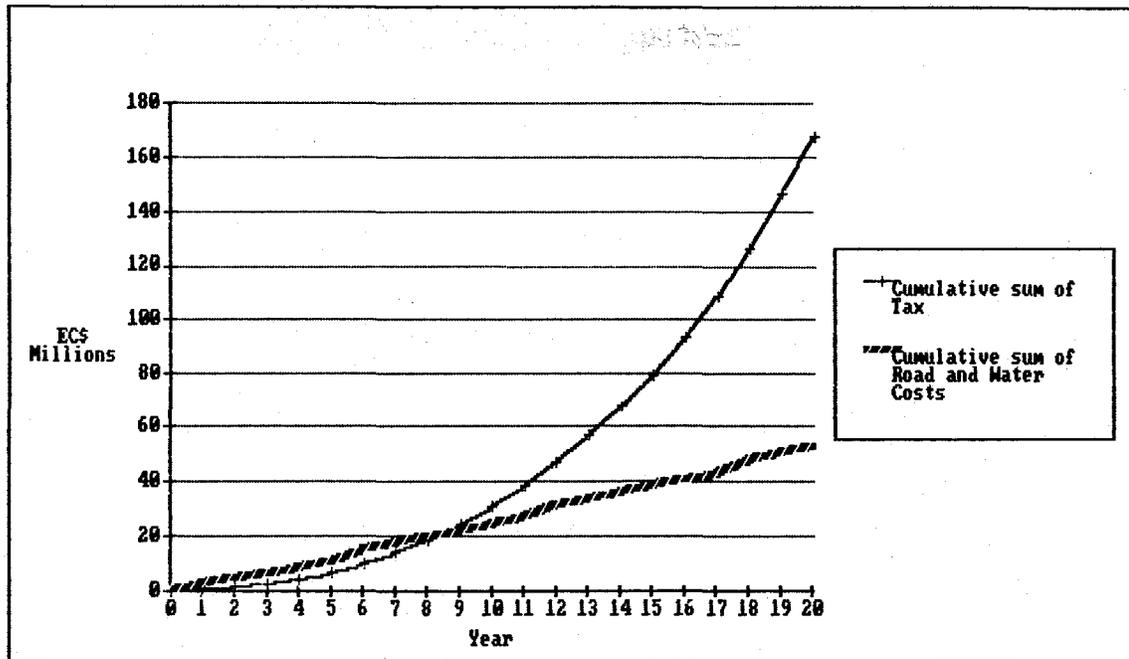


Figure 4.2. Cumulative tax receipts and road/water costs associated with Southeast Peninsula development.

premiums for tourism investments in St. Kitts, which are seen as risky because of St. Kitts' unproven potential in a highly competitive world and regional tourism market.

The "ideal" or preferred Managed Growth scenario emphasised in our economic analysis scores high on tourism realism and fiscal recovery criteria, satisfactory on labour force/inflation limits, and less so on hotel performance. This economic uncertainty for the hotel/resort sector (not unlike the low rates of return usually reported for resort development throughout the Eastern Caribbean) can be eliminated by managing the development of the Southeast Peninsula sufficiently well to permit charging high room rates and to create such an attractive, high quality environment that year round occupancy rates stay above 75 percent.

Successful long-term management of the Southeast Peninsula will depend on meshing the objectives of different interest groups. To create mutually beneficial cooperation between private and public sectors, on the one hand, investor plans must respect the unique scenic, wildlife, and undisturbed natural features of the Southeast Peninsula landscape. On the other hand, Government must use its long-term fiscal advantages to support the requirements for lucrative commercial efforts. Except for the possibility of securing Government support for investor fi-

nancing, discussed above, we do not favour Government subventions or subsidies. Rather, Government should be spending its funds to create the attractive physical, social and marketing environment necessary for sustained development. This is a difficult partnership and requires a delicate balancing of competing interests. Nevertheless, extraordinary efforts to achieve it are warranted in order to maintain the Southeast Peninsula's special character and unique potential. In short,

... merging tourism and conservation effectively is a tricky task, but one which may prove necessary in cases where a compromise of each is necessary for the survival of both (Stockly, 1984).

## 5. THE LAND USE MANAGEMENT FRAMEWORK: LEGAL AND INSTITUTIONAL ELEMENTS

### 5.1 The Dimensions of the Task

The opening of the Southeast Peninsula for development activities will result in a formidable set of new or expanded planning, management, and regulatory responsibilities for the Government of St. Kitts and Nevis. Prior to commencement of construction projects, Government must be prepared to establish both a legal and administrative framework within which an orderly but also creative process of economic growth and social change can take place without causing environmental damage. If the Government either underestimates the dimensions of this task or fails to provide sufficient support for implementing land management policies or environmental protection programmes, then the integrated development strategy proposed for the Peninsula will not be achieved.

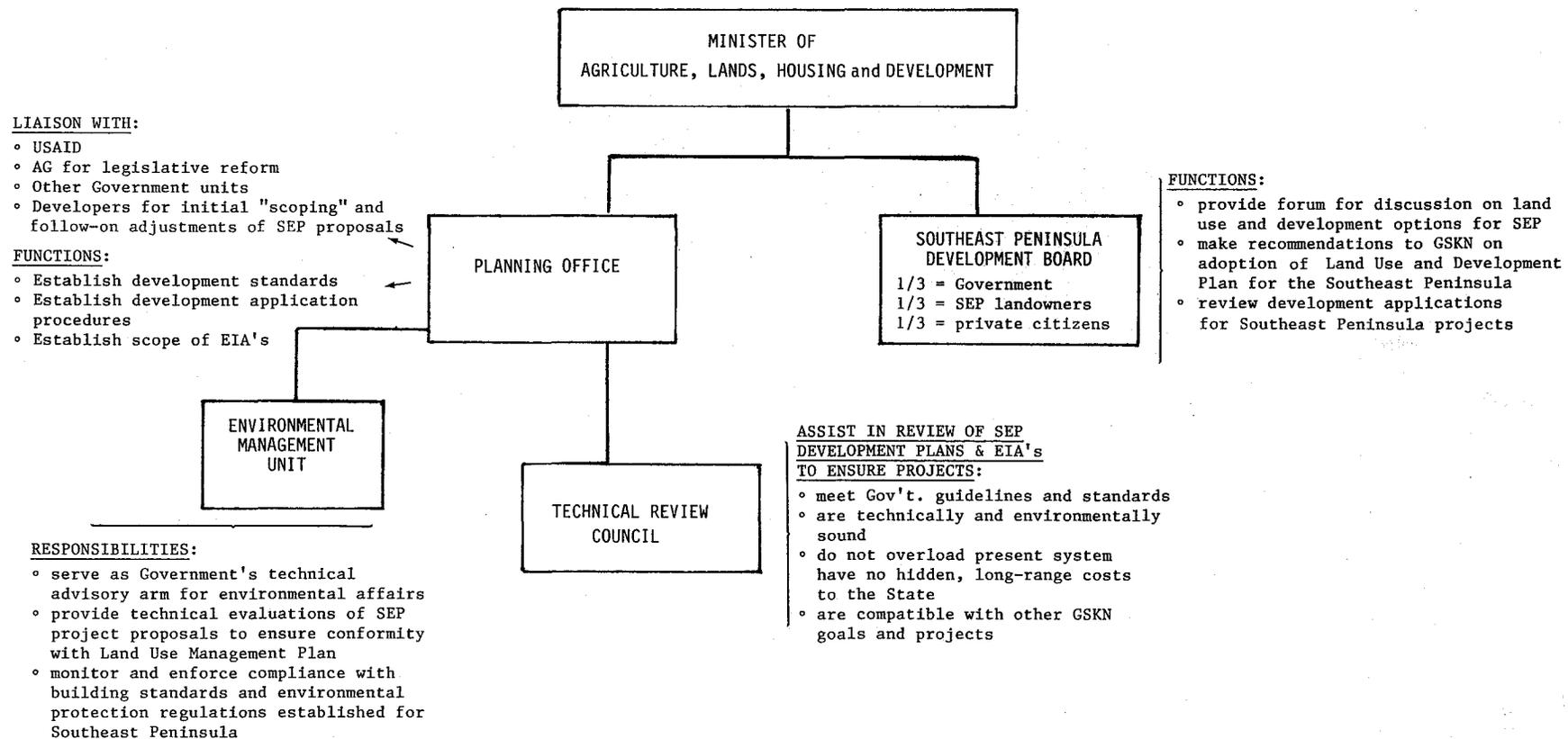
Appendix B of this report analyzes the existing institutional framework within which Peninsula development activities will be planned and executed. It also suggests several minor administrative and organisational adjustments to facilitate Government's role as development coordinator for the project. Finally, consideration is given to the fact that both public and private sector interests must be reflected in the specific land use alternatives selected for the Southeast Peninsula so that each project element is in harmony with the whole and contributes to national objectives. Appendix C reviews public policy issues related to the long-term resource management and environmental protection needs of the Peninsula and up-dates information provided earlier in the Environmental Assessment Report regarding needed legislative action.

### 5.2 Proposed Institutional Framework

Appendix B suggests certain ways for the GSKN to improve its planning, regulatory and management functions relative to the development of the Southeast Peninsula. The Appendix also justifies the establishment of an organisational framework for harmonizing public/private interests and facilitating communication, cooperation, and timely decision-making. The institutional structure provided represents minimum requirements to insure environmentally compatible development. Yet it is sufficiently modest to adapt with minor adjustments to Government's resource and personnel constraints. Figure 5.1 displays the essential organisational units proposed and their functional relationships. It includes the following elements.

(i) The Southeast Peninsula Development Board. It is recommended that a Development Board be created by enactment of appropriate legislation including rules and regulations for governing and managing the Board. It should be composed of nine persons to be appointed by Cabinet: 1/3 SEP landowners, 1/3 Government representatives, and 1/3

(revised)



5-2

Figure 5.1. Proposed institutional framework for Government of St. Kitts and Nevis to carry out regulatory and management functions relative to the development of the Southeast Peninsula.

non-government persons to be selected for their professional skills and/or independent perspective and record of community leadership.

With assistance and guidance from the Planning Office, an important first task of the Board will be to review and approve this Land Use Management Plan and to evaluate various strategic development options outlined therein, shaping the latter into an official Southeast Peninsula Development Plan which would subsequently be approved by the Government of St. Kitts and Nevis. Subsequent applications for Peninsula development projects will be required to meet the criteria and standards set forth in the Land Use Plan and the objectives outlined in the development strategy. All project proposals will be reviewed by the Board which will issue a formal "endorse/reject" sign-off (or "endorsement with conditions") on each application before it is forwarded to the Minister for final approval/disapproval.

(ii) The Planning Office. Primary responsibilities of the existing Planning Unit will fall within four areas: (1) liaison with donor agency, with the Attorney General's Office for legislative reform, with developers, with the SEP Development Board, and with other Government departments; (2) establishment of development standards and procedures for implementation of the SEP Land Use and Development Plan; (3) implementation of environmental protection regulations and development standards for the Peninsula; (4) serve as the Secretariat for the SEP Development Board.

The Planning Office will initially receive all development proposals for the Peninsula, will ascertain the completeness of each application and will circulate the same to the Development Board and other Government agencies (via the Technical Review Council, see [iv] below). The Planning Office, with input from its technical arm (the Environmental Management Unit, see [iii] below), will issue an endorse/reject (or endorse with conditions) sign-off on all project proposals and forward its recommendations to the Board for submission to the Minister.

(iii) The Environmental Management Unit. To assist Government in expanding its resource management and regulatory functions relative to Peninsula development, a new technical support unit of the Planning Office -- the Environmental Management Unit (EMU) -- should be established prior to commencement of road construction. Its responsibilities would initially focus on the Peninsula, but they could extend eventually to the entire country. Further, should the Ministry of Natural Resources and the Environment become functional, the activities of the EMU should be placed in that Ministry.

Specific responsibilities of the EMU should include:

- To serve as the Government's technical advisory arm for environmental affairs;

(revised)

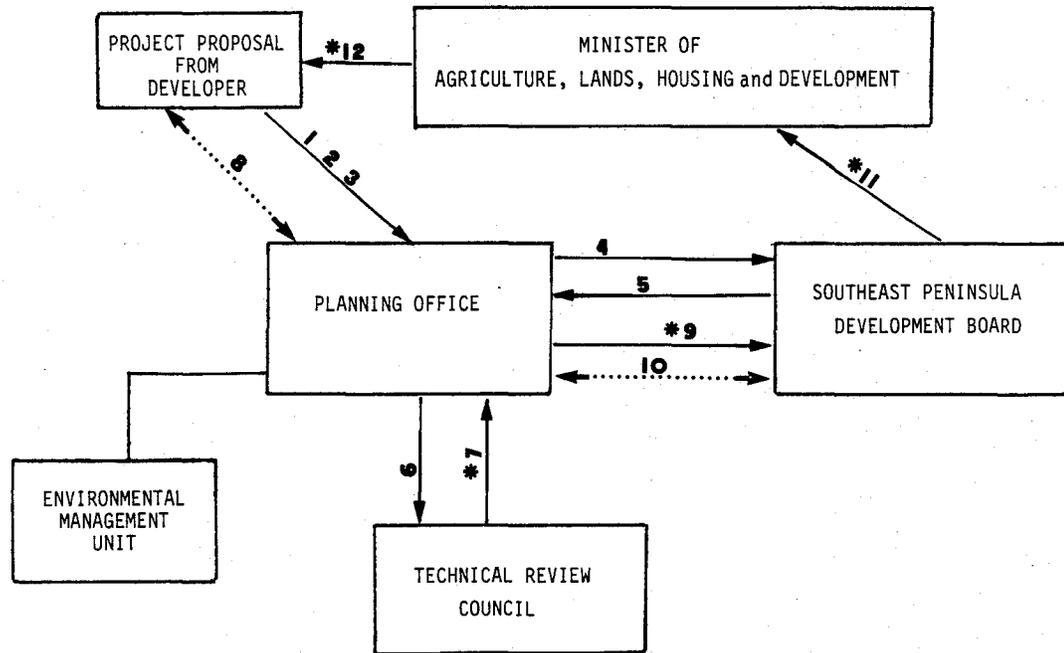
- To prepare technical evaluations of development applications, especially of Environmental Impact Assessments, to ensure conformity with the standards established in the official Land Use Plan;
- To solicit, as appropriate, input from other Government departments in the review of development applications and impact assessments;
- To assist the Planning Office in preparing recommendations on Peninsula development applications for forwarding to the Minister;
- To monitor construction of development projects on the Peninsula and enforce compliance with building standards and environmental protection regulations established in the Land Use Plan;
- To provide technical advice and assistance to the Development Board when so requested.

(iv) Technical Review Council. Oversight, monitoring and enforcement responsibilities of the EMU will be strengthened by establishment of a Technical Review Council which, in effect, represents an extension of the expertise of the EMU by providing a more formal framework for information exchange and technical consultation within Government as regards the Southeast Peninsula. Its establishment would help to ensure that development projects for the Peninsula:

- (1) meet Government guidelines and standards;
- (2) are technically and environmentally sound;
- (3) do not overload the capacity of present systems to cope with Peninsula growth;
- (4) have no hidden, long-range costs to the State;
- (5) are compatible with other Government goals and projects.

A primary function of the Technical Council will be to review SEP development applications, to formally issue an endorse/reject sign-off on all such project proposals and to forward its recommendations regarding submissions to the Planning Office.

It is recommended that the Director of Planning (or his assistant) serve as Chairperson of the Council with representatives from the following Government agencies designated by the Director to serve on the Council:



- 1/ Planning Office receives "notice of intent" from developer for a project on the Southeast Peninsula.
- 2/ Within a prescribed period of time Planning Office meets with developer to review proposed project, determines level of effort for EIA, and provides developer with EIA terms of reference.
- 3/ A formal development application, including EIA, is submitted to the Planning Office by the developer.
- 4/ The project proposal is referred to the SEP Development Board for preliminary review to ensure conformity with Southeast Peninsula development policies.
- 5/ After Board concurrence, application is referred back to the Planning Office for technical review.
- 6/ Application referred to Technical Review Council for study, evaluation and recommendations within prescribed time period and according to procedural guidelines established by the Planning Office.
- 7/ Technical Review Council issues a reject or endorse sign-off on the project or an "endorsement with conditions" sign-off. If the latter, specified conditions would be brought to the attention of the developer who would have to alter the proposal to meet the conditions set.
- 8/ While the Technical Review Council reviews the application, the Planning Office, through its Environmental Management Unit, carries out an evaluation focusing on the projected environmental impacts of the proposed project; meetings might be held with the developer to secure additional information or explore alternative, less environmentally detrimental options.
- 9/ Within a prescribed period of time, the Planning Office will forward its reject/endorse or endorse with conditions sign-off on the proposal to the SEP Development Board, along with the recommendations of the Technical Review Council.
- 10/ The SEP Board reviews the application; it may refer technical questions back to the Planning Office/ EMU or the Technical Review Council to assist in providing additional information.
- 11/ Within a prescribed period of time, the Board forwards its reject/endorse sign-off, along with that of the Planning Office and the Technical Review Council, to the Minister.
- 12/ Based on the development framework established in the SEP Land Use and Development Plan, taking into consideration the recommendations of the SEP Board, the Planning Office, and the Technical Review Council, and within a prescribed period of time, the Minister determines whether a land use permit will be granted for the proposed project.

\* Represents a sign-off step in the application process; three bodies (the Technical Review Council, the Planning Office, and the SEP Development Board) must review and sign-off on the application before it is forwarded to the Minister for final determination.

Figure 5.2. Procedures for submission and review of development applications and for the issuing of land use permits for Southeast Peninsula development projects, including submission of EIA's. (Revised)

- Ministry of Tourism and Labour
- Physical Planning Unit
- Central Housing Authority
- Fisheries Unit
- Ministry of Education, Health and Community Affairs  
(for coordination of environmental health issues and establishment of an Environmental Education Programme)
- Ministry of Communications, Works, and Public Utilities  
(specifically representatives of the Electricity Department, Water Department, and Public Works Department)
- Agriculture Department (specifically the Forestry Division)
- Police Department.

(See Appendix B, Section 3.4 for additional information on composition of the Technical Review Council.)

Figure 5.2 schematically outlines procedures for the submission and review of development applications for Southeast Peninsula projects, set within the parameters of the institutional framework suggested. A three-tier review process for project proposals has been outlined, which includes a review and sign-off role for the Technical Review Council, the Planning Office, and the SEP Development Board. The recommendations of each body are forwarded to the Minister of Development, who will issue the final approve or disapprove determination.

As outlined, the recommended structure provides for both standardized application procedures and for technical and professional input in the decision-making process at several levels. The inter-governmental recommendations of the Technical Review Council are forwarded to the Planning Office, which takes into account the judgment of that body, along with the recommendations of its own Environmental Management Unit, before making its determination on proposed development projects. The Planning Office's recommendations are forwarded to the Development Board which then has access to input from both an inter-departmental public sector body and from the technical specialists housed within the Planning Unit before issuing its own endorse/reject sign-off on the proposal. The application is then taken to the Ministerial level for final determination.

### 5.3 Time Line for Implementation of Institutional Requirements and Legislative Changes

Table 5.1 provides a chronological action agenda for expansion and upgrade of selected government sectors, for legislative reform, and for implementation of a regulatory framework associated with development of the Southeast Peninsula.

N.B. For a more explicit and extensive review of these matters, see also Appendix B.

(revised)

Table 5.1. Action agenda for implementation of Southeast Peninsula institutional requirements and legislative changes.

ACTION ITEM	INITIATOR	PREREQUISITE STEPS	ASSOCIATED LEGAL REFORM	SCHEDULING
ESTABLISHMENT OF SEP DEVELOPMENT BOARD	GSKN	<ol style="list-style-type: none"> <li>1) GSKN meeting(s) with SEP landowners to discuss responsibilities of the Board and secure landowner input</li> <li>2) Cabinet-level consensus regarding Board functions and composition</li> </ol>	Board to be formalized within the legal framework of the SEP Land Development and Conservation Act	Establishment of a "development council" must precede finalization of road construction contracts with USAID (see Memorandum of Understanding with GSKN)
OFFICIAL ADOPTION OF SEP LAND USE AND DEVELOPMENT PLAN	GSKN	<ol style="list-style-type: none"> <li>1) Circulation of IRF/LUMP within GSKN and to SEP landowners</li> <li>2) Schedule of meetings of SEP Board for review, discussion, and recommendations to GSKN on plan adoption</li> <li>3) Schedule of meetings with other interested groups</li> </ol>	Environmental protection standards and building guidelines reflected in EAR and IRF/LUMP need to be included in the Rules and Regulations promulgated for: <ul style="list-style-type: none"> <li>- Fisheries Act</li> <li>- Beach Control Act</li> <li>- Marine Pollution Act</li> <li>- SEP Land/Development Conservation Act</li> </ul>	Land Use Plan should be adopted by start of road construction; Rules and Regulations must be in place before first land use permit application is received
ESTABLISHMENT OF ENVIRONMENTAL MANAGEMENT UNIT (EMU)	GSKN	Planning Office to provide recommendations to AG's office regarding EMU functions and responsibilities	EMU to be established under the provisions of the SEP Land Development and Conservation Act	EMU should be functional by start of road construction; it will require external technical assistance during first 2-3 years
TRAINING OF PLANNING OFFICE STAFF, PARTICULARLY THOSE ASSIGNED TO EMU	GSKN Donor Agencies	<ol style="list-style-type: none"> <li>1) GSKN must identify environmental management as a training priority, select individuals, secure funding</li> <li>2) Initiation of on-island, short-term, incremental training activities utilizing appropriate external consultants</li> </ol>	None	Begin summer 1986 (demands on EMU will result from SEP development and will increase when Marine Pollution Protection Act becomes law)
ESTABLISHMENT OF TECHNICAL REVIEW COUNCIL	Planning Office	Planning Office should immediately begin to identify expertise required and individuals to serve; as a logical extension of technical resource committees established by GSKN to assist with the EAR and LUMP, the Technical Review Council could be functional immediately	Provision for formal establishment of Council should be provided for within the framework of the SEP Land Development and Conservation Act	Must be functional by end of road construction phase

Table 5.1 (continued).

ACTION ITEM	INITIATOR	PREREQUISITE STEPS	ASSOCIATED LEGAL REFORM	SCHEDULING
<p>PREPARATION AND IMPLEMENTATION OF PLANS, STUDIES, AND GUIDELINES RECOMMENDED IN THE EAR AND LUMP, with early priority given to:</p> <ul style="list-style-type: none"> <li>*development guidelines (including "Developers' Handbook")</li> <li>*EIA procedures</li> <li>*Recreation/Amenities Plan</li> </ul>	<p>Planning Office assisted by External Consultants</p>	<ol style="list-style-type: none"> <li>1) Procedures should be developed in consultation with SEP Board and Technical Review Council</li> <li>2) Delineation and assignment of task responsibilities for each step of the "development application process" must be clarified</li> <li>3) Management plans and prerequisite studies required are outlined in the EAR (Table 5.1)</li> </ol>	<p>Procedural requirements will be based on standards established in the Rules and Regulations for the Beach Control Act, Marine Pollution Protection Act, and the SEP Land Development and Conservation Act</p>	<p>Must be available before road has opened the Peninsula for even limited development</p>
<p>ESTABLISHMENT OF A PARK AND PUBLIC RECREATION MANAGEMENT FRAMEWORK FOR DESIGNATED SEP LANDS</p>	<p>GSKN</p>	<ol style="list-style-type: none"> <li>1) Easements and right-of-ways need to be negotiated with SEP land-owners</li> <li>2) Eventual establishment of a public management authority for SEP park and public recreation areas, e.g., "SEP Parks and Recreation Authority"</li> <li>3) Park management trainees must be identified as such personnel are not presently available within Government</li> </ol>	<ul style="list-style-type: none"> <li>- Draft National Parks and Historic Sites legislation must be enacted</li> <li>- Fisheries Regulations will provide management and protection for certain marine resources</li> </ul>	<p>Easements, etc. must be negotiated as soon as possible after SEP recreation plan completed;</p> <p>A "National Parks Planning Group" should be immediately created with public/private sector representation to review park management options available and make recommendations to GSKN</p>
<p>IMPLEMENTATION OF AN ENVIRONMENTAL EDUCATION PROGRAMME</p>	<p>GSKN</p>	<ol style="list-style-type: none"> <li>1) Establishment of "core group" for programme implementation as outlined in Appendix D of the EAR</li> <li>2) Determination of programme objectives and means for accomplishment by core group</li> </ol>	<p>None</p>	<p>Formation of core group should take place to coincide with start of road construction</p>

## 6. DEVELOPMENT PLANNING CONTROLS AND GUIDELINES

### 6.1 Making the Development Process Work

In the case of the Southeast Peninsula, at the present time there is probably a greater risk in planning too much than there is from planning too little. For St. Kitts and Nevis, as a small island country in the throes of shifting away from a dependency on sugar and towards a long agenda of pressing matters needing and consuming the attention of available leadership (and entrepreneurial skills), there are limits as to how complicated the environmental safety net for the Peninsula should be, especially during the early stages of the undertaking. There are severe constraints on how much time and effort Kittitian leaders and technicians can devote to this issue (as opposed to other priorities).

The Peninsula is large enough and the sequence of development events is likely to be slow enough so that the risk of major environmental failures or catastrophes is not near as great as the risk of taking excessive time, energy and resources to create ever more elaborate plans and planning procedures upfront. Instead, like the development process itself, both should be incremental, not monumental. Excessive preoccupation with completeness and intricacy of design for both the planning process and the plans themselves in a developing small island state ignore the fact that form follows function.

In the real world, the action-oriented political process finds ways to detour around inflexible obstacles like yesterday's detailed "master plan," now needing update through a cumbersome revision, re-design process. For this reason, this Land Use Management Plan for the Southeast Peninsula places more emphasis on the use of guidelines, checklists, and simple procedures. A flexible plan and permit procedure with carefully scheduled feedback from on-site compliance monitoring is infinitely more effective than an inflexible, elaborate blueprint with a complex approval process which may be so time consuming that little monitoring occurs and permitting delays induce circumvention.

With a detailed SEP Environmental Assessment Report and a broadly conceived and executed Land Use Management Plan now completed, the next cycle of events will be more action-oriented, more focussed on implementing the EAR and LUMP recommendations and on making key start-up decisions.

### 6.2 Control and Guidance

The appendices to this document address through a series of topical briefs both control mechanisms (governmental units, legislation, permitting, impact assessment) and also guidelines for developing and managing various services and natural features on the Peninsula. Activities traditionally presenting environmental problems have been em-

phasized. The list of cautionary management guidelines provided include the following subjects:

- Utilities (roads and parking, water and power)
- Sewage
- Solid Waste
- Spearfishing
- Salt Ponds
- Marinas
- Beaches
- Erosion Control
- Sand Mining
- Marketing.

These areas are, therefore, generally not addressed in the main text of this report; all (except spearfishing and marketing) were treated in some detail in the antecedent Environmental Assessment Report document.

### 6.3 Special Guidelines: The Amenities Agenda

#### 6.3.1 The Problem

In all complex planning schemes and exciting projects, there is always the risk that small but nonetheless important items, tasks and issues will be overlooked. It is too easy to forget to confirm the assumptions built into the often heard statement, "oh, we assumed 'they' will do that," or "we will take care of that later" or "that's not important now."

Secondly, during the course of the LUMP investigations, a growing gap in local perceptions about what needs to be done to make the Peninsula road and development scheme work was noted by the study team. From the landowners' perspective, the Government should only build the road, quickly provide water and power, and then stand aside; the owners will take it from there, preferably in as unfettered and unconstrained a format as possible. The Government has then only to sit back and collect revenues. Some landowners have expressed skepticism even about a Government role in marketing, in protected areas management, or in recreational facilities development.

On the other hand, Government obviously and correctly has defined a somewhat larger role for itself -- including environmental assessment and land use planning (which some landowners considered a "waste of time"), improved development permit procedures, tourism marketing of the State and the Peninsula as a "new destination," maximizing employment opportunities and, lastly, encouraging residential housing, public recreation facilities and a new "town" on the Peninsula.

Obviously, the "partnership" concept is still a long way from becoming a reality.

### 6.3.2 The Challenge

There is a large gap -- a hidden agenda of tasks -- that falls between the two perspectives highlighted in the preceding section, a list of which would include the following:

- reforestation of damaged or erosion-prone SEP areas
- roadside and public area landscaping
- nurseries for the first two items above (which should be started now)
- navigational aids (buoys, beacons, and markers -- presuming a marina is built and "yachting tourism" encouraged)
- public jetty and associated parking (recommended for White House Bay)
- customs and immigration facilities and services
- fire, postal and police services
- signs and sign control (directional, locational and informational)
- hiking trail system (including easements)
- horseback riding trail system (including easements)
- archaeological and historic site development as attractions
- public toilets for SEP day visitors (local and tourist) at key locations (before there are hotels nearby).

The locus of responsibility for all of the above probably resides with Government, but most will require varying degrees of involvement, cooperation and participation on the part of one or more SEP landowners. Few will happen in an orderly and effective fashion if left to the private sector. Most are essential to the effective development of the Peninsula as a world-class resort area and first-class local recreational facility. Some, fortunately, will be required before others. All will cost money -- perhaps as much as half the cost of the road itself for the entire list when completed. Funding for some is available even now -- assuming a modicum of preliminary planning is undertaken.

Unfortunately, our economic analysis (see Section 4 and Appendix A) suggests the private sector landowners are unlikely to have a sufficiently large profit margin to be able to afford many of these amenities, from which all will benefit -- including the Peninsula's environment. If this proves to be the case, then the landowners need to see Government as a needed partner and assist in the search for funding and the development of an action agenda to provide these required amenities on some agreed upon schedule over the next few years.

Government, on the other hand, needs to move rapidly to expand its current agenda to include the above list of tasks needing resolution as to who is going to do what, when and with what resources. Planning should be started as soon as possible on most items -- if only to ar-

rive at preliminary cost figures and ranking of priorities as to importance, timing and phasing requirements.

This public sector aspect of Peninsula development requires special emphasis since government-initiated environmental planning has been weak the world over. Evidence, however, also suggests that the two key causes of this poor public performance have been the lack of clearly defined and allocated resource management responsibilities and the absence of duly assigned authority to carry out these tasks:

... the basic problem is the absence of public institutions that have the appropriate range of power and responsibilities and the appropriate incentives to choose among options in the public interest (Mills and Graves, 1986).

This Land Use Management Plan attempts to address this concern by outlining appropriate actions to be taken by Government to insure that institutional and legislative changes required for Peninsula development and protection are effectively implemented (see especially Table 5.1).

## REFERENCES

### SOUTHEAST PENINSULA DOCUMENTS

Arendt, W., 1985. Wildlife assessment of the Southeastern Peninsula, St. Kitts, West Indies. U.S. Agency for International Development/Regional Development Office/Caribbean, Bridgetown, Barbados.

Beard Dove Caribbean, 1981. Great salt pond development, St. Kitts, West Indies: preliminary cost report. Basseterre, St. Kitts.

Beekhuis, J. and Co., 1985. Preliminary outline of a tourism strategy for the United States Agency for International Development in the English speaking Eastern Caribbean (with section on "St. Kitts Road"). U.S. Agency for International Development/Regional Development Office/Caribbean, Bridgetown, Barbados.

Brimer, Martin, Maggs, Keeble and Partners, 1968. A road to Cockleshell Bay from Frigate Bay, St. Kitts: preliminary design and estimate of cost. Sussex, England.

Coopers and Lybrand, 1983. Final report, a study of the economic feasibility of the South East Peninsula development project for St. Kitts and Nevis. Submitted to Government of St. Kitts and Nevis, Canadian International Development Agency, U.S. Agency for International Development.

Goodwin, M., Heyliger, S., Wilkins, R., 1986. Progress report on development of a management plan for the St. Kitts and Nevis spiny lobster fishery. Fisheries Division, Ministry of Agriculture, Lands, Housing and Development, Basseterre, St. Kitts.

Island Resources Foundation, 1986. Environmental assessment report on the proposed Southeast Peninsula access road, St. Kitts, West Indies. Prepared by IRF for GSKN, St. Thomas, Virgin Islands.

Jackson, I., 1981. Southeastern Peninsula, St. Kitts, study of management alternatives. Caribbean Conservation Association/Eastern Caribbean Natural Area Management Programme in collaboration with the Government of St. Kitts and Nevis.

Lashley, D. and Partners, 1985. Final report, estimated cost to construct the Southeast Peninsula road, St. Kitts. U.S. Agency for International Development/Regional Development Office/Caribbean, Bridgetown, Barbados.

Preinvest, Inc., 1985. Preinvestment analysis, St. Kitts Southeast Peninsula development and road. U.S. Agency for International Development/Regional Development Office/Caribbean, Bridgetown, Barbados.

Reid, C., 1977. The past, present and future of the Salt Ponds Peninsula, St. Kitts, the West Indies. Master's thesis, York University, Downsview, Ontario, Canada.

Robert R. Nathan Associates, Inc., May 1986 (draft). Potential for recovery of public investments and costs: Southeast Peninsula, St. Kitts. Report prepared for the Government of St. Kitts and Nevis.

Roughton and Partners, 1980. South East Peninsula road, economic study report. Financed by the European Development Fund for the Government of St. Kitts and Nevis. United Kingdom.

Roughton and Partners, 1981a. Contract for the construction of the South East Peninsula road. 3 vols. Financed by the European Development Fund for the Government of St. Kitts and Nevis. United Kingdom.

Roughton and Partners, 1981b. South East Peninsula road, engineering design report. Financed by the European Development Fund for the Government of St. Kitts and Nevis. United Kingdom.

Talbot, J., 1985. Initial environmental examination (IEE), St. Kitts Southeast Peninsula access road project (AID 538-0138). U.S. Agency for International Development/Regional Development Office/Caribbean, Bridgetown, Barbados.

Towle, E., Rainey, W., Skerritt, R. and Williams, V., 1985. Tourism and the environment: a case study of Frigate Bay, St. Kitts. Prepared by Island Resources Foundation for The Economic Commission for Latin America and the Caribbean.

#### ST. KITTS AND NEVIS REFERENCES

Bebb, J. and Ervin, S., n.d. Development guidelines for St. Kitts, understanding, appreciating and using island resources. Master's thesis, University of Massachusetts.

Bouvier, L., 1984. St. Kitts and Nevis: yesterday, today and tomorrow. PRB occasional series: the Caribbean. Population Reference Bureau, New York.

Cambers, G., 1983. Coastal erosion in St. Kitts and Nevis, vol. 1, St. Kitts. Caribbean Oceanographic Consulting Co., S.A., Barbados.

Chameleon Press, Ltd., 1984. Investor's guide to St. Christopher-Nevis. London.

Eastern Caribbean Central Bank, 1986. Quarterly commercial banking statistics: December 1985. ECCB, Research Department, Basseterre, St. Kitts.

Eastern Caribbean Natural Area Management Program, 1980. Survey of conservation priorities in the Lesser Antilles: St. Kitts preliminary data atlas. St. Croix, U.S. Virgin Islands.

Hochlaf, H., 1984. Land use plan, St. Kitts and Nevis. World Bank Contract # RLA/82/004. The Pragma Corp., Falls Church, Virginia.

Lang, D. M. and Carroll, D. M., 1966. Soil and land-use surveys, no. 16, St. Kitts and Nevis. Regional Research Centre, Imperial College of Tropical Agriculture, University of the West Indies, Trinidad.

Lynch, R., 1979. Marine resources survey report, St. Kitts and Nevis. Consulting report prepared for Eastern Caribbean Natural Area Management Program, St. Croix, U.S. Virgin Islands.

Merrill, G. C., c. 1954. The historical geography of St. Kitts and Nevis, British West Indies. Preliminary report of field work done under U.S. Office of Naval Research (ONR) contract 222(11), Nr 388 067.

Merrill, G. C., 1958. The historical geography of St. Kitts and Nevis, the West Indies. Instituto Panamericano de Geographia e Historia, publication no. 232.

Midgett, D., 1985. St. Kitts and Nevis. In: Hopkins, J. (ed.), Latin America and Caribbean contemporary record: III. Holmes and Meier, New York.

Richardson, B., 1983. Caribbean migrants: environment and human survival on St. Kitts and Nevis. U. of Tennessee Press, Knoxville.

Spitzer, J.D., 1984. Mission report on marine pollution prevention, control, and response in Saint Christopher and Nevis. Report prepared for International Maritime Organization (IMO).

St. Kitts and Nevis Government, 1985 (10 December). 1986 budget address delivered by the Rt. Hon. Dr. Kennedy A. Simmonds, Prime Minister.

St. Kitts and Nevis Government, Department of Labour, 1985. The Federation of St. Kitts and Nevis annual report of the Department of Labour for the year 1983. Presented to the Minister of Agriculture, Lands, Housing, Labour and Tourism by Rupert E. Herbert, Acting Labour Commissioner. Basseterre, St. Kitts.

St. Kitts and Nevis Government, Ministry of Agriculture, Lands, Housing and Development. Annual digest of statistics, 1973, 1980, 1982, 1984. The Statistical Office, Planning Unit, Basseterre, St. Kitts.

St. Kitts and Nevis Government, Ministry of Agriculture, Lands, Housing and Development, 1986. National accounts, 1977-1984, St. Christopher and Nevis. The Statistical Office, Planning Unit, Basseterre, St. Kitts.

St. Kitts and Nevis Government, Ministry of Tourism, 1982. A proposed five year tourism development plan for St. Kitts. Basseterre, St. Kitts.

St. Kitts and Nevis Government, National Assembly, 1984. St. Kitts and Nevis estimates for the year 1985. Basseterre, St. Kitts.

St. Kitts and Nevis Tourist Board, 1986. St. Kitts and Nevis accommodation guide, 1985-86. Basseterre, St. Kitts.

The Courier, 1985. St. Christopher and Nevis. No. 94 (Nov.-Dec., 1985):31-48.

UNDP Physical Planning Project, 1976. St. Kitts and Nevis, the environment. UNDP Physical Planning Project Unit, St. Kitts.

U.S. Agency for International Development (USAID), 1985. St. Kitts and Nevis Country Supplement to the Caribbean Regional CDSS, 1986-1990. Regional Development Office/Caribbean, Bridgetown, Barbados.

Williams, V., 1983. St. Kitts and Nevis, country summary. In: Wood, J. (ed.), 1984, proceedings of the workshop on biosphere reserves and other protected areas for sustainable development of small Caribbean islands, Caneel Bay, St. John, Virgin Islands (May 10-12, 1983). U.S. National Park Service, southeast regional office, Atlanta, Georgia.

World Bank, 1983. St. Kitts and Nevis economic memorandum. Report no. 4744-CRG. Washington, D.C.

World Bank, 1985. St. Christopher and Nevis: Economic Report. Washington, D.C.

#### REGIONAL AND TECHNICAL REFERENCE

Adams, A.D., n.d (draft). Caribbean uniform building code, section 8: requirements for structural timber buildings. Caribbean uniform building code project (CUBIC). Kingston, Jamaica.

Adams, P.F., et al., 1983. Caribbean uniform building code (CUBIC) project, steel structures for buildings: part 1, limit states design. Department of Civil Engineering, U. of Alberta.

Adams, P.F., et al., 1983. Caribbean uniform building code (CUBIC) project, steel structures for buildings: part 2, working stress design. Department of Civil Engineering, U. of Alberta.

Adams, P.F., et al., 1983. Caribbean uniform building code (CUBIC) project, steel structures for buildings: part 3, commentary. Department of Civil Engineering, U. of Alberta.

Agarwala, R., 1983. Planning in developing countries: Lessons of experience. World Bank staff working papers number 576. Washington, D.C.

deAlbuquerque, K. and McElroy, J., 1982. West Indian migration to the U.S. Virgin Islands. International migration review, 16(1): 61-101.

Andrews, G.G.C., 1984. Report on the Caribbean uniform building code: reinforced and prestressed concrete. Faculty of Engineering, U. of West Indies, St. Augustine, Trinidad.

Archer, A.B., c. 1983. Report on land-based sources of pollution in coastal, marine and land areas of CARICOM states. Prepared for UNEP/CARICOM/PAHO project for the protection of the coastal and marine environment of Caribbean islands. Bridgetown, Barbados.

Barada, B., 1974. Logical fallacies of the spearfishing controversy. Skin Diver (September).

Blommestein, E., 1985. Tourism and environment in Caribbean development: an overview of the Eastern Caribbean. Economic Commission for Latin America and the Caribbean, subregional headquarters for the Caribbean, Port-of-Spain, Trinidad.

Bohnsack, J., 1986. National Marine Fisheries Service, Southeast Research Center, personal communication.

Boxhill, B., 1982. Employment generated in tourism in the Caribbean region. Caribbean Tourism Research and Development Centre, Barbados.

Brock, R., Lewis, C. and Wass, R., 1979. Stability and structure of a fish community on a coral patch reef. Marine Biology 54:281-292.

Bryant, C. and White, L., 1982. Managing development in the third world. Westview Press, Boulder, Colorado.

Caiden, N. and Wildavsky, A., 1980. Planning and budgeting in poor countries. Transaction Books, New Brunswick, New Jersey.

Cambers, G., 1985. An overview of coastal zone management in six east Caribbean islands (Grenada, St. Vincent, St. Lucia, Dominica, St. Kitts, Antigua). Report to UNESCO Regional Office for Science and Technology for Latin America. Montevideo.

Caribbean Tourism Research and Development Centre, 1984 and 1985. Caribbean tourism statistical report. CTRC, Christ Church, Barbados.

Caribbean Tourism Research and Development Centre, 1986 (14 February). Statistical news. CTRC, Christ Church, Barbados.

Caribbean Tourism Research and Development Centre, 1986 (March/April). Caribbean tourism, 6(1). CTRC, Christ Church, Barbados.

Caribbean Uniform Building Code (CUBIC) Project, n.d. (draft). Recommendation for the design of buildings: structural design requirements for concrete masonry building design and construction (part 2, section 4). Faculty of Engineering, U. of West Indies, St. Augustine, Trinidad.

Chmura, G.L. and Ross, N.W., 1978. The environmental impacts of marinas and their boats: a literature review with management considerations. University of Rhode Island marine memorandum no. 45. Narragansett, Rhode Island, USA.

Deane, C., Thom, M., and Edmunds, H., 1973. Eastern Caribbean coastal investigations, 1970-73. Vol. IV: alternative sources of fine aggregate in the Eastern Caribbean. British Development Division in the Caribbean, Trinidad. 5 vol.

Dommen, E. and Hein, P. (eds.), 1985. States, microstates and islands. Croom Helm Publishers, Dover, New Hampshire, USA.

Goodwin, M., et al., 1984. An assessment of the mariculture potential of indigenous Eastern Caribbean brine shrimp (U.S. Agency for International Development grant no. DPE-5542-G-SS-3054-00). Island Resources Foundation, St. Thomas, U.S. Virgin Islands.

Goodwin, M., et al., 1985. Fishery sector assessment: Antigua/ Barbuda, Dominica, Grenada, Montserrat, St. Kitts and Nevis, St. Lucia, St. Vincent and Grenadines (U.S. Agency for International Development contract no. 38-0000-C-00-5011). Island Resources Foundation, St. Thomas, U.S. Virgin Islands.

Grigg, R., 1983. Resource management of precious corals: a review and application to shallow water reef building corals. Marine Ecology 5:57-74.

Hayden, B.P., R. Dolan, S. Hoffman, A. Robinson, 1978. Shoreline erosion in a reef-beach system. Environmental management, 2(3):209-218.

Johannes, R.E. and Ferguson-Wood, E.J., 1975. Tropical Marine Pollution. Elsevier Publishing.

Kenchington, R. and Salvat, B., 1984. Man's threat to coral reefs. In: Kenchington, R. and Hudson, B. (eds.), Coral reef management handbook. UNESCO, Jakarta, Indonesia.

Khan, J., 1982. Public management: the Eastern Caribbean experience. Department of Caribbean Studies, Royal Institute of Linguistics and Anthropology, Leiden, Netherlands.

Lewsey, C.D., 1978. Assessing the environmental effects of tourism development on the carrying capacity of small island systems: the case for Barbados. Doctoral dissertation, Cornell University.

Mathieson, A. and Wall, G., 1982. Tourism: economic, physical and social impacts. Longman, New York.

McElroy, J., 1978. An export base employment model of the Virgin Islands economy. Virgin Islands Department of Commerce, St. Thomas.

McElroy, J. and deAlbuquerque, K., 1986a. The British Caribbean. In: Hopkins, J. (ed.), Latin America and Caribbean Contemporary Record: III. Holmes and Meier, New York.

McElroy, J. and deAlbuquerque, K., 1986b. The impact of migration on the demographic transition of insular microstates. World development journal (forthcoming).

McElroy, J. and Tinsley, J., 1982. U.S. Virgin Islands. In: Seward, S.B. and Spinrad, B.K. (eds.), Tourism in the Caribbean: the economic impact. International Development Research Centre, Ottawa, Canada.

Mills, E.S. and Graves, P.E., 1986. The economics of environmental quality. Norton, New York.

Murdock, J., 1957. A survey of spearfishing in the Florida Keys. Proc. Gulf Carib. Fish. Inst. 9:112-120.

Officer, C.B. and Ryther, J.H., 1977. Secondary sewage treatment versus ocean outfalls: an assessment. Science, 1979 (Sept.): 1056-1060.

Olsen, D. and Wood, R., 1983. The marine resource base for marine recreational fisheries development in the Caribbean. Proc. Gulf Carib. Fish. Inst. 35:152-160.

Porter, H.L., 1976. Comprehensive erosion and sediment control training program for engineers, architects and planners. Prepared under contract to the Virginia Soil and Water Conservation Commission. NACO Service Department, League City, Texas, USA.

Reutlinger, S., 1970. Techniques for project appraisal under uncertainty. Johns Hopkins, Baltimore, Maryland, USA.

Salm, R.V., 1984. Ecological boundaries for coral-reef reserves: principles and guidelines. Environmental conservation, II(3):209-215.

Seward, S.B. and Spinrad, B.K., 1982. Tourism in the Caribbean: the economic impact. International Development Research Centre, Ottawa, Canada.

Sorensen, J., et al., 1984. Institutional arrangements for management of coastal resources. Coastal publication no. 1, renewable resources information series. Research Planning Institute, Columbia, South Carolina, USA.

Stockly, M., 1984. Tourism and conservation: compatible ideas? Nexus, 6(3):1-7.

Thompson, T. P., 1985. Appropriate Methodologies for identification of impacts (and) appropriate methodologies for evaluation of alternatives. Papers presented at a workshop on environmental impact assessment, sponsored by the Pan American Health Organization for the Caribbean subregion, Kingston, Jamaica (June 3-14, 1985). Island Resources Foundation occasional paper nos. 42 and 43, St. Thomas, U.S. Virgin Islands.

Towle, E., 1985. The island microcosm. In: Clark, J. R. (ed.), Coastal resources management: development case studies. Research Planning Institute, Columbia, South Carolina, USA.

Towle, J.A. and E.L., 1985. Evaluation report on the Eastern Caribbean Natural Area Management Program. Prepared by Island Resources Foundation for Rockefeller Brothers Fund and World Wildlife Fund-U.S. St. Thomas, U.S. Virgin Islands.

Transportation Research Board (TRB), 1980 (April). Erosion control during highway construction, manual on principles and practice. Report no. 221. Washington, D.C.

Transportation Research Board (TRB), 1980 (June). Design of sediment basins. Report no. 70. Washington, D.C.

Travel and Tourism Consultants International (TTCI), 1981. North American demand study for Caribbean tourism. Caribbean Tourism Research and Development Centre, Bridgetown, Barbados.

U.S. Army, Corps of Engineers, 1983. Dredging and dredged material disposal. Engineer Manual No. 1110-2-5025. Washington, D.C.

U.S. Environmental Protection Agency (EPA), 1976. Erosion and sediment control -- surface mining in the eastern United States. Vol. 1: planning; vol. 2: design. EPA technology transfer seminar publication (October 1976), EPA 625/3-76-006. U.S. EPA-ORD, Center for Environmental Research Information, Cincinnati, Ohio.

U.S. Environmental Protection Agency (EPA), 1985. Coastal marinas assessment handbook. Region IV Office, Atlanta, Georgia.

U.S. Government (Agency for International Development and National Park Service), 1981. Legal, regulatory, and institutional aspects of environmental and natural resource management in developing countries. Produced under the AID/NPS Natural Resources Project. U.S. AID (Forestry, Environment and Natural Resources) and U.S. NPS (International Affairs), Washington, D.C.

Virgin Islands Soil and Water Conservation District, 1976 (3rd ed.). Environmental protection handbook. Kingshill, St. Croix, U.S. Virgin Islands.

Virgin Islands Government, Dept. of Conservation and Cultural Affairs, Coastal Zone Management Program, 1984-85. Handbook for home builders and developers. St. Thomas, U.S. Virgin Islands.

World Commission on Environment and Development, 1985. Mandate for change: key issues, strategy and workplan. Switzerland

Young, G., 1973. Tourism: blessing or blight? Harmondsworth: Penguin Books.

#### MAPS

Baker, Lt. Samuel, RN, 1753. St. Christopher in America (copy in possession of Mr. D. Lloyd Matheson, St. Kitts; original in London).

Directorate of Overseas Surveys (DOS), 1979 (Edition 1). St. Christopher and Nevis, 1:50,000, Series E703, (DOS 443).

Directorate of Overseas Surveys (DOS), 1984 (Edition 5). St. Christopher (St. Kitts), Lesser Antilles 1:25,000, Series E803 (DOS 343).

Norwood, Andrew, 1660. A map of St. Kitts. Surveyor General of England, London.

St. Kitts and Nevis Government, Planning Office, 1958 (showing roads as per 1928). Southeast Peninsula, 5 June, 1958 (retraced 15 April, 1980 by Matthews and Fraites), 336 yds = 1 in.

St. Kitts and Nevis Government, Planning Office, 1980. Southeast Peninsula, 1:25,000 topographic map dated 14 February, 1980.

U.S. Government, Defense Mapping Agency, 1984 (August). Approaches to St. Christopher and Nevis, #25601, 1:100,000.

AERIAL PHOTOGRAPHS

Aero Services Corp., Division of Litton Industries, 1962/63. Series #1241.

Directorate of Overseas Surveys (DOS), 1946. Series #1843.

Directorate of Overseas Surveys (DOS), 1968. Series #511 (Fairey Surveys).

Directorate of Overseas Surveys (DOS), 1982. Air photography contract no. 99.

Eastern Caribbean Natural Area Management Program (ECNAMP), 1980. 35 mm slide series.

LIST OF CONTACTS  
SOUTHEAST PENINSULA LAND USE MANAGEMENT PLAN

- Mr. Ceasar N. ANQUILLARE, President, NEIDCORP (The New England International Development Corporation)
- Mr. Dwyer ASTAPHAN, representative of Southeast Peninsula landowner, Mrs. E. Walker
- Mr. James BAILEY, Public Works Superintendent
- Mr. Michael BENTLEY, Smiths Gore; representative of Southeast Peninsula landowner, Carl Fuchs
- Mr. Oswald BLAICH, Public Management and Policy Planning Project
- Mr. Peter BRIDGES, Manager, Fort Thomas Hotel
- Mr. Richard C. BROOMFIELD, Chief Engineer and Manager, Electricity Department, Public Works
- Mr. Michael DIVELY, Secretary/Treasurer of Mukti Fund (donor to the St. Kitts-Nevis Foundation for National Development and St. Kitts-Nevis Chamber of Industry and Commerce)
- Mr. Campbell EVELYN, landowner, Southeast Peninsula
- Ms. Cynthia FIELD, Statistian, Planning Office
- Mr. Robert FOSTER, Public Management and Policy Planning Project
- Mr. Carl FUCHS, landowner, Southeast Peninsula
- Mr. Michael GOLDGAR, landowner, Southeast Peninsula
- Mr. Aubrey E. HART, Director of Planning; member of the Local Technical Resource Committee for the LUMP
- Dr. William HERBERT, landowner, Southeast Peninsula
- The Honourable Hugh HEYLIGER, Minister of Agriculture, Lands, Housing and Development
- Mrs. Pat HOBSON, Government Training Officer, Establishments
- Mr. Richard HOWES, Public Management and Policy Planning Project
- Sir Probyn INNIS, representative of Southeast Peninsula landowner, Carl Fuchs

Mr. Reginald KAWAJA, landowner, Southeast Peninsula

Mr. F.E. KELSICK, landowner, Southeast Peninsula

Mr. William LIBURD, Managing Director, Frigate Bay Development Corporation

Mr. Richard LUPINACCI, Bank of Nevis and Nevis Conservation and Historical Society

Mr. Kenneth MARTIN, Chief Agricultural Officer

Mr. D. Lloyd MATHESON, Brimstone Hill Society/National Park Foundation

Mrs. Patsy MATTHEW, Physical Planning Unit

Mr. Erroll MAYNARD, Head, St. Kitts-Nevis Peace Corps Office

Mr. Thomas A. McKENZIE, Forestry Development and Resource Management Planning Project, Organization of American States, St. Kitts

Dr. Richard A. MEGANCK, Natural Resource Specialist, Organization of American States

Mr. D.L. MENDIS, Attorney General's Office

Mr. John MILLER, Managing Director of Royal Bank of Canada, St. Kitts

Mr. Thomas MOLYNEAUX, Central Housing Authority; member of Local Technical Resource Committee for the LUMP

Mrs. Colin PERIERA, Ocean Terrace Inn

Mr. Eugene PETTY, Permanent Secretary, Ministry of Agriculture, Lands, Housing and Development; member of Local Technical Resource Committee for the LUMP

The Honourable Michael O. POWELL, Deputy Prime Minister and Minister of Tourism and Labour

Mr. Athil RAWLINS, Chief Engineer, Water Department, Public Works; member of Local Technical Resource Committee for the LUMP

Mr. Ian A. REID, landowner, Southeast Peninsula

Mr. Larkland RICHARDS, Director of Tourism

Mr. Tapley SEATON, Attorney General

Mr. Richard SKERRITT, Executive Director, St. Kitts-Nevis  
Chamber of Industry and Commerce

Mr. James VLAUN, Chief Engineer, Jack Tarr Village, Frigate Bay

Mrs. Christopher WALWYN, landowner, Southeast Peninsula

Mr. Charles WILKIN, landowner, Southeast Peninsula

Mr. Ralph WILKINS, Fisheries Officer

Mr. Arthur WILLIAMS, Eastern Caribbean Central Bank

Mr. Victor WILLIAMS, Physical Planning Officer, Planning Unit

LAND USE MANAGEMENT PLAN  
SOUTHEAST PENINSULA, ST. KITTS  
MEMBERS OF THE PROJECT TEAM

(In Alphabetical Order)

[Information in brackets following name indicates  
position on Environment Assessment Team]

IVOR JACKSON [Deputy Team Leader/Land Use Planner]. Born in Antigua, Mr. Jackson received a Master's Degree in regional planning from the University of Rhode Island. He has worked as a Town and Country Planner in Antigua/Barbuda and the British Virgin Islands and as a consultant to a variety of international assistance agencies in the Caribbean, including IUCN/WWF, OAS, and the Commonwealth Fund for Technical Cooperation. He has served as a Director of the Caribbean Conservation Association and is currently the Caribbean regional representative on IUCN's executive council. As a consultant to the Eastern Caribbean Natural Area Management Programme (ECNAMP), Mr. Jackson was the author of an earlier study on the Southeast Peninsula (Jackson, 1981); he was a member of the EA team for the Southeast Peninsula Road Project.

BARBARA J. LAUSCHE [Environmental Legislation Advisor]. Currently serving as the Counsel for Public Policy, Environment, and Development Programmes at the World Wildlife Fund-US, Barbara Lausche brings to the present assignment fourteen years experience in environmental law, including international legislation and policy development. She spent four years in The Gambia, West Africa as a teacher and legal drafter and has subsequently carried out short term, international consultancies in other developing countries, including India, Nigeria, Sri Lanka, Guyana, Oman, Bermuda, and the Eastern Caribbean. Dr. Lausche, whose law degree is from Catholic University in Washington, D.C., is an appointed member of three IUCN Commissions.

NICHOLAS J.O. LIVERPOOL [Environmental Legislation Advisor]. Born in Dominica, Dr. Liverpool has been Dean of the Faculty of Law of the University of the West Indies Cave Hill Campus since 1984. He has extensive experience throughout the Eastern Caribbean and the Bahamas as a legal advisor to governments, more recently serving as a consultant to the Ministry of Tourism and the Environment in Barbados and assisting in the drafting of the St. John's (Antigua) urban renewal/redevelopment legislation. He holds a Ph.D. degree from Sheffield University in England. Dr. Liverpool was a member of the EA team for the Southeast Peninsula Road Project.

JEROME L. McELROY [Tourism Economist]. A Caribbean resident in the U.S. Virgin Islands from 1972-1981, Dr. McElroy served as an economics professor on the faculty of the College of the Virgin Islands and as Director of Policy Planning for the V.I. Government's Department of Commerce (with an emphasis on tourism and economic development). He has devoted over 15 years to Caribbean, "small island" focused research, including publications on tourism and resource management in the Eastern Caribbean. Dr. McElroy holds a doctorate degree in economics from the University of Colorado.

BRUCE G. POTTER [Resource Economist]. A senior planning advisor with Mobil Oil Corporation from 1980-85 (with responsibilities for monitoring economic development trends in West Africa and Southeast Asia), Mr. Potter has also lived and worked in the Eastern Caribbean (1973-80). In the U.S. Virgin Islands, he served as Senior Budget Analyst for the Territorial Government and designed a management information systems for the Budget Office. As a former Peace Corps Volunteer, Mr. Potter also served that agency as Central American Desk Officer and Chief Latin America Programme and Training Officer. He holds a B.A. degree from the College of William and Mary in government and economics.

LUIS A. TORRES [Architect/Land Use Planner]. Born in Puerto Rico, Mr. Torres holds an architecture degree from the University of Notre Dame. He has practiced architecture and planning, principally in the Caribbean, for 19 years, including consulting work in the areas of land use planning, urban revitalization, historic preservation, and development of tourism amenities and facilities. Recent assignments for the OAS in the Eastern Caribbean have included tourism development projects in Grenada and waterfront/urban renewal planning in Antigua.

EDWARD L. TOWLE [Team Leader/Resource Planner]. With 19 years of residency and programme management experience in the Eastern Caribbean, Dr. Towle's area of focus has been on the development of interdisciplinary team management approaches to addressing critical resource development issues in small island systems. A co-founder of the Island Resources Foundation (1971), Towle is also a past president (1968-1974) of the Caribbean Conservation Association. He is an appointed member of two IUCN Commissions, serves on the U.S. Man and the Biosphere Programme Directorate for Islands, and has been a consultant to UNDP, U.S. AID, CIDA, SIDA, WWF, FAO, and UNESCO. He has published over 40 books, articles and technical reports dealing with island systems, most recently a broad overview of the theory and practice of island system research and development planning, including guidelines for project design appropriate to smaller island areas. He holds a doctorate degree from the University of Rochester. Dr. Towle was a member of the EA team for the Southeast Peninsula Road Project.

JUDITH A. TOWLE [Public Management Specialist/LUMP Report Co-Editor]. With a Master's Degree from American University in public administration and international development, Ms. Towle has been a resident of the Eastern Caribbean for over 17 years. She is co-founder of the Island Resources Foundation and serves as its chief administrative/fiscal officer. She has published in the areas of West Indian environmental education, historical resource management, and development administration. Ms. Towle was a member of the EA team for the Southeast Peninsula Road Project.

WERNER WERNICKE [Engineering Consultant]. With a M.S. Degree in Engineering from the University of California at Berkeley, Mr. Wernicke has been a resident of the U.S. Virgin Islands for over 15 years. He is the former head of the Virgin Islands Coastal Zone Management Programme and has since worked as an independent consultant in the areas of coastal resource management and environmental impact assessment. Mr. Wernicke was a member of the EA team for the Southeast Peninsula Road Project.

Additional technical assistance was provided by Dr. Melvin Goodwin (of Environmental Research Projects) in the area of marine resource utilization and by Dr. Nik Douglas (of the Anguilla Archaeological and Historical Society), who furnished recent information on the Anguilla tourism experience. Mrs. Margaret Liburd of St. Kitts provided on-site secretarial and office support for the IRF team and also assisted the Attorney General's Office by typing legislation drafts related to the land use planning project.

## APPENDIX A

### SOUTHEAST PENINSULA DEVELOPMENT: ECONOMIC PROJECTIONS

#### A.1 INTRODUCTION

#### A.2 APPROACH TO ECONOMIC ANALYSIS

#### A.3 THE SETTING

A.3.1 Population

A.3.2 The Economy

#### A.4 TOURISM

A.4.1 Product Characteristics

A.4.2 Performance

A.4.3 Visitor Profile and Other Characteristics

A.4.4 Visitor Expenditures

A.4.5 Tourism Projections

#### A.5 METHODOLOGY FOR CONSTRUCTING DEVELOPMENT SCENARIOS

A.5.1 Access Road and Water System Construction and Fiscal Recovery

A.5.2 Hotel Construction Impacts

A.5.3 Visitor Expenditures and Economic Impacts

A.5.4 Hotel Profitability Analysis

A.5.5 Other Non-Hotel Southeast Peninsula Facilities

#### A.6 ANALYSIS

A.6.1 Twenty Year Tourism Development Model

A.6.2 Private Investment Models

A.6.3 Public Investment Models

## APPENDIX A

### LIST OF TABLES

- A-1 Population of St. Kitts and Nevis, 1844-1980.
- A-2 St. Kitts and Nevis: Recent population trends, 1975-1983.
- A-3 Population and labour force projections.
- A-4 St. Kitts and Nevis gross domestic product by economic activity in constant 1977 prices: percentage distribution.
- A-5 St. Kitts and Nevis gross domestic product by economic activity, at factor cost in constant 1977 prices.
- A-6 Annual sectoral growth rates and estimates of GDP contribution in 1986.
- A-7 Projections of GDP and the sectoral distribution of GDP, 1986 and 2006.
- A-8 Tourist arrivals in the Caribbean.
- A-9 St. Kitts and Nevis hotel and guest room accommodations, 1972-1985.
- A-10 Cruise passenger arrivals.
- A-11 Composition of visitor demand, 1980-1984.
- A-12 Tourists staying in private accommodations in 1984.
- A-13 Room occupancy rates.
- A-14 Monthly tourist arrivals by air only.
- A-15 Room occupancy rates by island, 1975-1982.
- A-16 Average per day and total annual expenditures by type of visitor, 1978-1984.
- A-17 Projected average year-round daily rate of Southeast Peninsula hotel rooms.
- A-18 Estimates of Southeast Peninsula hotel revenue by expenditure category and distribution of operating income.
- A-19 Early development scenario: tourism supply-side development.
- A-20 Early development scenario: tourism demand-side development.
- A-21 Early development scenario: total St. Kitts tourism growth.
- A-22 Manageable growth scenario: tourism supply-side development.
- A-23 Manageable growth scenario: tourism demand-side development.
- A-24 Manageable growth scenario: total St. Kitts tourism growth.
- A-25 Private investment models.
- A-26 Public infrastructure model: Southeast Peninsula road.
- A-27 Public infrastructure model: Southeast Peninsula water distribution system.

## APPENDIX A

### SOUTHEAST PENINSULA DEVELOPMENT: ECONOMIC PROJECTIONS

#### A.1 INTRODUCTION

According to the Minister of Tourism and Labour for St. Kitts and Nevis, Michael Powell, (personal communication, March 1986), the opening of the Southeast Peninsula presents the Government of St. Kitts and Nevis with a privileged opportunity to achieve something truly path-breaking in the Eastern Caribbean:

- to create a tasteful and attractive environmental tourism on which to anchor the country's economic diversification strategy, and
- to provide access for local residents to pristine recreation and scenic resources, national wildlife and marine treasures for generations to come.

This general policy direction, in conjunction with the Southeast Peninsula's unique natural assets, suggests that a proposed development scenario must be designed to achieve several objectives simultaneously.

Ideally, the pace of new construction and the level of visitor/resident density and resource use must be sufficiently robust:

- (1) to insure hotel profitability, and
- (2) to recoup operating expenses and part of the capital costs of the road network.

On the other hand, growth must be sufficiently modest:

- (3) to sustain long-term natural asset quality,
- (4) to avoid depleting the local labour supply and/or to forego intermediate food/raw material linkages with the insular economy, and
- (5) to fall within reasonable expectations for St. Kitt's future share of foreign tourism demand given intense regional and international competition, changing currency alignments, and the vagaries of the political environment.

In addition to those five conditions, constructing a realistic Southeast Peninsula development plan is complicated by other problems. First, some of the primary data on which to base the forecast are either unavailable or unreliable. For example, comprehensive labour force, unemployment, and employment distribution data do not exist. Moreover, gross domestic product and hotel occupancy statistics suffer from considerable nonreporting and underreporting.

Second, past studies have employed either unrealistic assumptions (see Preinvest's [1985] critique of Coopers and Lybrand [1983] study) or proven highly conjectural. For example, the Government of St. Kitts and Nevis' "1982 Tourism Development Plan" projects in the "pessimistic" scenarios over 1800 hotel rooms by 1986, against experience (March, 1986) of roughly 850. The "optimistic" forecast was 4,000.

Third, the present task for the LUMP team requires projections for a 20 year period in a region which has shown remarkable shifts and changes in short periods of time throughout its history. This obviously weakens confidence in development scenarios because of uncertainty about a host of parameters normally assumed constant over a five to ten year time horizon, including unanticipated major events which could condition the validity of forecasting for the Southeast Peninsula. (As an example of the above, the unforeseen U.S. embargo of Cuba was largely responsible for rapid tourist expansion in the U.S. Virgin Islands in the 1960's. This demand for construction and service labour was then largely responsible for depletion of the St. Kitts and Nevis pool after 1962, when Britain imposed immigration restrictions. [See de Albuquerque and McElroy, 1982].) Therefore, in addition to the usual distortions introduced by the unevenness of real-world investment flows conflicting with a linear forecast model, this long-period requirement attaches a certain speculative character to the analysis. We are reasonably confident about the first decade, less so about the second.

Finally, projecting the behavior of small tightly-coupled island systems like St. Kitts and Nevis is fraught with special hazards not only because of small base numerical distortion but also because relatively minor events/adjustments can translate into major impacts (errors) on the outcome.

Given the constrained targets the project scenario(s) are required to satisfy (see Section 1.3), along with the substantive data and methodological difficulties identified above, a degree of caution, expressed in conservative growth assumptions, informs the analysis which follows. Moreover, because of the uncertainty imposed by the 20-year forecast horizon, intuitive conservative judgement about the likely occurrence of non-controllable factors is employed, as is common in investment risk analysis (Reutlinger, 1970). To minimize errors, this intuition is drawn, insofar as data allow, from the historical behavior of St. Kitts and Nevis and, where lacking, from the documented experience of other tourist-led island economies in the region. Finally, cautious economic expectations may be particularly warranted in

the Southeast Peninsula area since long-run economic success hinges in great part on protecting and enhancing amenity quality. However, this merging of tourism and conservation in practice is difficult to anticipate ex ante because it invariably involves compromise on both sides, if only to not compromise key natural processes and environmental systems essential to sustainable development.

On the one hand, some restrictions on tourism activity for 'protected areas' or conservation purposes may be necessary even if it means less revenue than desired. On the other hand, tourism, if it is to be successful, is likely to have at least some impact on the natural environment regardless of the controls imposed (Stockly, 1984).

The unclear scope and direction of such compromises and the absence of mechanisms for reaching them expeditiously breeds further uncertainty and clouds forecasting.

## A.2 APPROACH TO ECONOMIC ANALYSIS

The economic analysis included in the LUMP report is in five parts, four of which are included in this Appendix and the fifth forms the basis of Section 4 in the main body of the report. The first briefly reviews the macroeconomic and demographic structure and performance of St. Kitts and Nevis and provides the basis for overall economic and labour force projections. The second examines the recent behavior of the tourism sector including product characteristics, composition of visitor demand, and medium and long-term growth patterns for stay-over and cruise ship tourists. The third details the assumptions used in developing the five sub-analyses needed to construct the 20-year Southeast Peninsula development scenarios. The five sub-analyses include: (1) access road construction and fiscal recovery, (2) hotel/condominium construction plus stay-over spending projections and impacts, (3) day-trippers (visitor and resident) spending and impacts, (4) hotel(s) profitability analysis, and (5) other recreational facility profit analysis and impacts. The fourth section of the analysis reports a range of development scenarios and discusses the results of "sensitivity analyses" tied to some of the more crucial assumptions employed by the LUMP team. The economic analysis also includes an executive summary of the overall macroeconomic and labour force impacts associated with the Southeast Peninsula, justifies the choice of a specific development scenario to guide decision-makers and briefly suggests some follow-up policy steps necessary for successful implementation. The summary is found in Section 4 of this report.

### A.3 THE SETTING

#### A.3.1 Population

The demographic history of St. Kitts and Nevis is highly relevant (see Table A-1). First, the population has remained remarkably stable over the past 100 years. Decennial changes have varied no more than 10-15% in either direction, and average annual growth rates have been consistently low. Over the entire century and a half (1844-1980), the population grew less than 0.3% per year.

Second, demographic swings have been largely the result of the vagaries of sugar and emigration opportunity, similar to the contemporary period. After sugar production peaked in the 1880's, the population declined steadily as St. Kitts and Nevis workers routinely migrated to Trinidad, Bermuda, the Dominican Republic, and later the United States (Richardson, 1983). Population increases between 1921-1960 were initiated by U.S. immigration restrictions (1924) but were fueled mainly by expanded sugar production made possible by new refining and railroad construction technology. Between 1960 and 1975, however, sugar production declined 50% (World Bank, 1985), and massive out-migration primarily to the U.S. Virgin Islands averaged 1,000-1,500 per year (McElroy and de Albuquerque, 1986b). Local observers estimate that between 6,000-12,000 workers -- equivalent to roughly one-fifth of the current population of St. Kitts and Nevis -- are employed off-island.

Finally, Table A-1 data underline the dominance of St. Kitts in the two-island federation, comprising 78% of the total population in 1980.

To provide a projection base, Table A-2 presents detailed St. Kitts and Nevis trends covering most recent years for which published data are available. These figures indicate annual population growth over the entire 1975-1983 period of 0.5% and 1.0% between 1979-1983. Extrapolating an average rate of 0.7% through 1986 yields an end-year population of 46,087. From this assumed Southeast Peninsula project start-up date, an annual rate of 0.65% was employed over the 20 year forecast period using the rate of natural increase plus net migration growth formula and the following assumptions:

1. The crude birth rate will decline from present 1983 levels of 29 (per 1,000) because of the likely impacts of modernization, but average 26 over the forecast period.
2. The crude death rate will average 10 (per 1,000) since most infant mortality declines have already been achieved.
3. The crude rate of net migration (rate of emigration per 1,000) will average 9.5 because of the historical persistence of St. Kitts and Nevis livelihood mobility. This rate represents roughly

Table A-1. Population of St. Kitts-Nevis, 1844 - 1980.

YEAR	ST. KITTIS	NEVIS	ST. KITTIS/NEVIS	ABSOLUTE CHANGE	AVE. AMT. CHANGE %
1844	23,177	9,571	32,748		
1861	24,440	9,822	34,262	1,514	0.3
1871	28,619	11,703	40,322	6,060	1.8
1881	29,137	18,864	41,001	679	0.2
1891	30,876	13,087	43,963	2,962	0.7
1901	29,782	12,774	42,556	-1,407	-0.3
1911	26,283	12,945	39,228	-3,328	-0.8
1921	22,415	11,569	33,984	-5,574	-1.4
1946	29,818	11,388	41,206	7,222	0.9
1960			50,883	9,677	1.7
1970	33,753	11,131	44,884	-5,999	-1.2
1980	33,868	9,441	43,309	-1,575	-0.4

Sources: 1844-1946, St. Kitts-Nevis, Leeward Islands, West Indies Population Census, 1946; 1960, St. Kitts-Nevis, Anguilla, West Indies Population Census, 1960; 1970 and 1980, St. Kitts-Nevis, Commonwealth Caribbean Census, 1970 and 1980.

Table A-2. St. Kitts-Nevis: recent population trends, 1975-1983.<sup>1</sup>

	1975	1976	1977	1978	1979	1980	1981	1982	1983 <sup>2</sup>
End Year Population	43,280	42,881	43,284	43,014	43,050	43,309	44,269	44,646	45,133
Crude Birth Rate (per '000) <sup>3</sup>	25.4	30.8	28.0	24.6	28.1	27.0	25.7	29.3	29.7
Crude Death Rate (per '000) <sup>3</sup>	9.9	11.1	11.6	10.8	12.3	11.4	10.2	11.3	10.8
Crude Net Migration Rate (per '000) <sup>3</sup>	-24.8	-29.0	-7.1	-20.1	-15.0	-9.7	6.2	-9.6	-8.1
Total Births	1,099	1,320	1,212	1,059	1,211	1,170	1,137	1,307	1,341
Total Deaths	427	476	503	466	529	493	450	503	489
Natural Population Increase	672	844	709	593	682	677	687	804	852
Net Migration	-1,074	-1,243	-306	-863	-646	-418	273	-427	-365
Net Population Increase	-402	-399	403	-270	36	259	960	377	487

1 Sources: GSKN, Annual Digest, 1973, 1980, 1982; McElroy and deAlbuquerque, 1986b (Table 3).

2 Estimated from average births, deaths, net migration, 1975-1982.

3 Island Resources Foundation estimates.

440 emigres for 1986 and reflects no major long-term increases resulting from the expanded U.S. quota associated with recent St. Kitts and Nevis political independence.

These assumptions yield a growth rate of 6.5 per 1000 population [(26.0-10.0)-9.5] or 0.65% per year.

Table A-3 presents results of the 20-year forecast. The figures indicate absolute and relative increases of 6,378 and 13.8%, respectively (outcomes certainly within historical experience for long-period swings). Included also are labour force projections. They are initially based on a labour force participation rate (persons 15-64/total population) of 35% for 1986, common to other small Caribbean islands depleted by emigration. Over the forecast period the rate rises to 41% to reflect stability in the age-sex structure expected from long-run economic expansion, reduced emigration, and some return migration. This increase is analogous to, but less extreme than the experience of the U.S. Virgin Islands between 1950-1970, when the labour force participation rate rose from 31 to 47% (de Albuquerque and McElroy, 1982). It seems consonant with more modest changes occurring presently in other expanding Eastern Caribbean islands like the Bahamas, British Virgin Islands, and Caymans (McElroy and de Aluquerque, 1986b).

Such asumptions yield a growth in the St. Kitts and Nevis labour force over the forecast period from 16,130 to 21,510. This represents a net increase of 5,380 and an annual rate of 1.7% per year. By comparison, this labour force growth is below the 2.2% estimated by Bouvier, 1984 (Scenario B) for St. Kitts and Nevis from 1980 through 2000 using a participation rate peak of 47%. On the other hand, the population projections are somewhat higher because of a slightly higher fertility assumption employed in this analysis.

### A.3.2 The Economy

The contemporary St. Kitts and Nevis economy is a classical export-propelled system in a dual structure. Traditionally, sugar and government service have dominated St. Kitts -- controlling up to four-fifths of overall economic activity -- while Nevis is characterized by small-holder agriculture, livestock grazing, fishing and small-scale tourism. Generally, this is comparable to the highly open structure common in the Eastern Caribbean with activity divided evenly between export and residentiary sectors. Growth is transmitted primarily through export proceeds -- hence the historical significance of sugar -- which are exchanged for domestic goods/services and imports.

Table A-4 traces recent changes in the sectoral distribution of Gross Domestic Product between 1977 and 1984. These data pinpoint the structural shifts involved in the economy's ongoing transition from a mono-crop to a diversified base. These figures clearly identify the

Table A-3. Population and labour force projections.

YEAR	POPULATION <sup>1</sup>	LABOUR FORCE PARTICIPATION RATE <sup>2</sup>	LABOUR FORCE <sup>3</sup>
1	46,387	.35	16,235
2	46,689	.35	16,341
3	46,992	.36	16,917
4	47,297	.36	17,027
5	47,604	.36	17,137
6	47,913	.37	17,729
7	48,224	.37	17,843
8	48,538	.37	17,959
9	48,854	.38	18,564
10	49,172	.38	18,685
11	49,492	.38	18,807
12	49,814	.39	19,427
13	50,138	.39	19,554
14	50,464	.39	19,681
15	50,792	.40	20,317
16	51,122	.40	20,449
17	51,454	.40	20,582
18	51,789	.41	21,233
19	52,126	.41	21,372
20	52,465	.41	21,510

1 IRF estimates based on an annual average increase of 0.65% and a 1986 estimate of 46,087.

2 Percent of the total population between 15 and 64 years.

3 Total population times the labour force participation rate.

Table A-4. St. Kitts-Nevis gross domestic product by economic activity in constant 1977 prices (EC\$ million): percentage distribution.

	1977	1978	1979	1980	1981	1982	1983	1984
1. Agriculture	18.9	19.2	19.3	16.8	16.7	15.8	13.5	13.9
1.1 Sugarcane	12.0	12.0	11.8	10.0	9.5	9.2	7.6	8.0
1.2 Crops (other)	2.1	2.2	2.7	2.5	2.4	2.0	1.5	1.5
1.3 Livestock	3.4	3.4	3.1	2.8	3.0	2.8	2.5	2.5
1.4 Forestry	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1.5 Fishing	1.3	1.5	1.6	1.4	1.7	1.7	1.8	1.8
2. Mining and Quarrying	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3
3. Manufacturing	18.1	18.5	17.3	16.9	14.4	14.7	13.8	14.5
4. Electricity and Water	0.9	1.0	1.0	1.1	1.1	1.1	1.2	1.2
5. Construction	9.5	6.9	7.9	9.6	9.5	10.6	9.2	9.1
6. Wholesale and Retail Trade	10.1	10.9	10.8	11.7	10.9	11.4	12.9	12.7
7. Hotels and Restaurants	2.1	3.1	3.6	3.3	3.5	2.8	2.9	3.1
8. Transport	5.5	5.7	5.1	5.4	5.8	5.6	6.0	5.9
8.1 Road Transport	4.2	4.1	3.7	3.9	4.3	4.2	4.5	4.4
8.2 Sea Transport	0.6	0.6	0.5	0.6	0.6	0.6	0.7	0.7
8.3 Air Transport	0.7	1.0	0.9	0.9	0.9	0.8	0.8	0.8
9. Communications	3.0	3.0	3.0	3.2	5.3	4.9	5.3	5.2
10. Banks and Insurance	5.5	5.1	5.3	5.3	5.0	5.6	5.9	5.8
11. Real Estate and Housing	7.6	7.5	7.0	6.9	6.6	6.3	6.7	6.6
12. Government Services	17.0	18.0	19.1	19.3	19.4	19.5	20.6	19.9
13. Other Services	5.1	4.6	4.4	4.7	5.1	5.0	5.6	5.6
14. Less Imputed Service Charges	3.6	3.7	4.0	4.5	3.6	3.6	3.9	3.8
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: GSKN, National Accounts, 1977-1984 (1986).

secular deterioration in the sugar industry as well as compensatory increases in government, export manufacturing (textiles, electronic assembly, beverages), tourism and related trade, finance, and other services. The expected long-term continuation of such trends underlines the Government's stated diversification strategy into domestic agriculture, export substitution, and social infrastructure (The Courier, 1985), including specific policy emphasis on Southeast Peninsula development.

The major question which clouds the horizon is the sugar crisis. Between 1979-1983 production fell 30%, and field and factory employment decreased 28% (World Bank, 1985). A constellation of factors have been responsible: chronic labour shortage from emigration and competition from other sectors (USAID, 1985); world oversupply; metropolitan demand for artificial sweeteners; factory under-utilization; poor harvesting methods; unfavourable sterling exchange declines; a 25% cut in the U.S. export quota; and continuing tense labour-management relations (Midgett, 1975).

Since sugar directly and indirectly accounts for a quarter of insular activity, the impact of its slide has been deeply embedded in related imbalances throughout the economy. For example, primarily because of failing sugar exports between 1978 and 1984, the merchandise trade deficit increased from US\$7.5 million to US\$27.0 million and the deficit/Gross Domestic Product ratio rose from 27% to over 80% (World Bank, 1985). This growing visible trade deficit was largely erased by a steady stream of off-island remittances and a remarkable doubling of tourist revenues over the period.

In the public sector, the current budget shifted from an EC\$6 million surplus in 1980 to an EC\$9 million deficit by 1984 (World Bank, 1985). This erosion was due to the discontinuation of the sugar levy after 1981 (EC\$11.7 million in 1980 or one-fifth of all revenue) to reduce losses in the government-owned sugar industry. As a result, the tax/Gross Domestic Product ratio declined from 29 to 19%. In addition, financing the growing deficit diverted investment resources from public infrastructure projects as capital spending fell between 1980-1984 by two-thirds. Moreover, short-term borrowing to keep the sugar industry solvent in the face of product prices below production costs increased the Government's holding of total bank loans from 29% in 1980 to 40% in 1984 (ECCB, 1986), thus limiting private access to funds. Since remittances from emigres working abroad habitually finance considerable off-island purchases of consumer durables, thus yielding negative private savings, this expanded public bank borrowing -- to keep sugar afloat and maintain essential capital projects -- has resulted in increased net external indebtedness, albeit at concessional rates.

Such imbalances underline the importance of sugar in the trade-dependant St. Kitts and Nevis economy and emphasise the crucial role of exports in general. Because of the long-term pessimism surrounding the present demand and supply limitations constraining sugar, clearly

Table A-5. St. Kitts-Nevis gross domestic product by economic activity, at factor cost in constant 1977 prices (EC\$ million).

	1977	1978	1979	1980	1981	1982	1983	1984
1. Agriculture	13.10	13.70	14.86	13.44	14.09	14.09	11.50	12.32
1.1 Sugarcane	8.31	8.54	9.07	8.03	7.97	8.25	6.52	7.05
1.2 Crops (other)	1.42	1.62	2.09	1.99	2.05	1.74	1.25	1.35
1.3 Livestock	2.39	2.43	2.41	2.21	2.54	2.49	2.11	2.21
1.4 Forestry	0.05	0.05	0.06	0.07	0.07	0.08	0.08	0.08
1.5 Fishing	0.93	1.06	1.23	1.14	1.46	1.53	1.54	1.63
2. Mining and Quarrying	0.20	0.15	0.18	0.23	0.24	0.28	0.23	0.24
3. Manufacturing	12.54	13.15	13.31	13.58	12.15	13.17	11.72	12.83
4. Electricity and Water	0.61	0.71	0.74	0.88	0.94	1.00	1.01	1.02
5. Construction	6.59	4.94	6.09	7.72	7.99	9.49	7.77	8.08
6. Wholesale and Retail Trade	7.01	7.75	8.32	9.36	9.20	10.18	10.95	11.25
7. Hotels and Restaurants	1.42	2.21	2.78	2.61	2.91	2.50	2.48	2.72
8. Transport	3.81	4.03	3.94	4.31	4.85	5.03	5.13	5.23
8.1 Road Transport	2.90	2.93	2.82	3.14	3.57	3.75	3.81	3.87
8.2 Sea Transport	0.41	0.43	0.42	0.47	0.52	0.55	0.58	0.61
8.3 Air Transport	0.50	0.67	0.70	0.70	0.76	0.73	0.74	0.75
9. Communications	2.05	2.15	2.35	2.57	4.44	4.38	4.51	4.64
10. Banks and Insurance	3.79	3.63	4.06	4.28	4.19	4.96	5.04	5.12
11. Real Estate and Housing	5.26	5.31	5.40	5.50	5.57	5.62	5.71	5.80
12. Government Services	11.75	12.84	14.69	15.45	16.30	17.46	17.54	17.62
13. Other Services	3.55	3.31	3.37	3.75	4.29	4.50	4.72	4.95
14. Less Imputed Service Charges	2.48	2.64	3.10	3.59	3.06	3.25	3.30	3.35
TOTAL	69.20	71.24	76.99	80.09	84.10	89.41	85.01	88.47

Source: GSKN, National Accounts, 1977-1984 (1986).

future economic stabilization and prosperity, as well as achievement of the social service imperatives stemming from a youthful population (half under 20 years), will depend largely on the success of light manufacturing, tourism, and related construction and services. Tables A-5 and A-6 provide the basis for designing a reasonable scenario for this transition over the 20-year projection period.

Table A-5 records the sectoral distribution of Gross Domestic Product between 1977 and 1984. These data highlight the overwhelming importance of government services and the publicly-owned sugar industry which together account for 30% of the 1984 Gross Domestic Product. For projection purposes, Table A-6 estimates simple annual growth rates for each sector between 1977-1984 and the most recent five-year period for which published data are available, 1979-1984. The sectoral distribution of Gross Domestic Product for 1986 is then estimated from the 1984 figures using roughly the same annual growth rates obtained from the 1979-1984 period. These estimates provide the basis for the 20-year forecast developed in Table A-7.

In order to project long-term prospects for the St. Kitts and Nevis economy, first an annual average growth rate of 3.0% was assumed for real Gross Domestic Product (EC\$million) in 1977 prices between 1986-2006. This is similar to the 3% rate recorded between 1979-84 and, given population projections less than 1%, yields a net annual increase in per capita income of roughly 2%, an improvement viewed necessary to support demographic assumptions of lower emigration rates than obtained between 1960-1975.

Second, using estimated 1986 data, economic sectors were clustered into six major activities to more sharply identify key sectors: (1) agriculture (plus sugar manufacturing), (2) export manufacturing, (3) tourism, (4) construction, (5) an "All Other" category including trade, transport, communication, utilities, finance and realty, and other services, and (6) government. Tourism activity was estimated from hotel output plus contributions from wholesale/retail trade, transport, finance/realty, other service, etc. based on allocation ratios developed in McElroy (1978) for the U.S. Virgin Islands with appropriate downward adjustments for the relatively narrow St. Kitts and Nevis tourism base. As a result of these adjustments, the 1986 benchmark figures clearly demonstrate the service-bias nature common to small Eastern Caribbean economies. In the St. Kitts and Nevis case, service activity in 1986 -- all other (33%), government (20%), tourism (11%) -- contributed over 60% of the total Gross Domestic Product.

Next, differential linear compound growth rates were assumed over the forecast period for the six sectors to sketch out the long-term contours of St. Kitts and Nevis' transition to a more diversified base. Because of the highly speculative nature of this exercise, these projections were based primarily on past performance but conditioned by reasonable expectations about the small territory's competitive potential in the Caribbean context. For example, government and all

Table A-6. Annual sectoral growth rates and estimates of GDP contribution in 1986.<sup>1</sup>

	1977-1984 %	1979-1984 %	GDP 1986 (EC\$) <sup>2</sup>
Sugar <sup>3</sup>	-3.3	-3.7	\$ 12.5
Agriculture/ Mining	1.5	-1.5	5.5
Manufacturing	8.6	5.6	7.0
Construction	3.2	6.2	9.0
Transport/Communi- cation/Utilities	9.5	10.9	11.0
Hotels	13.3	1.0	3.0
Trade	8.8	7.2	13.0
Finance/Realty <sup>4</sup>	2.0	3.4	8.0
Other Services	5.6	9.4	6.0
Government	7.0	4.0	19.0
GDP	4.0	3.0	94.0

1 All data computed from Table A-5.

2 Estimate based on 1979-84 growth rate except unchanged (1984) levels for sugar, agriculture, and transport, etc.

3 Includes sugar manufacturing. Break out from p. 67, GOSK, Annual Digest, 1982.

4 Minus imputed service charges.

Table A-7. Projections of GDP and the sectoral distribution of GDP, 1986 and 2006 (EC\$ 1977).

	1986 <sup>1</sup>	% GDP	Projected Annual Compound Growth Rates	2006	%GDP
Agriculture <sup>2</sup>	18.0	19.1	-2.0	9.0	5.3
Manufacturing	7.0	7.5	1.5	9.0	5.3
Tourism <sup>3</sup>	10.0	10.6	7.0	39.0	22.8
Construction	9.0	9.6	5.0	24.0	14.0
All other <sup>4</sup>	31.0	33.0	3.0	56.0	32.7
Government	19.0	20.2	3.0	34.0	20.0
GDP	94.0	100.0	3.0	171.0	100.0 <sup>5</sup>

1 Computed from Table A-6.

2 Includes sugar manufacturing.

3 Includes 100% hotel activity, 25% finance/realty/other services and roughly 15% of trade/transportation/communication/utilities.

4 Includes trade, transport, communication, utilities, finance, realty, and other services.

5 May not sum to 100.00 because of rounding.

other services were projected to increase 3% in tandem with Gross Domestic Product, while light manufacturing -- because of its volatility in the face of unpredictable extraneous influences -- was expected to grow only 1.5% annually. Agriculture/sugar was projected to decline 2% per year, while high rates were forecast for construction (5%) because of its close association with an expanding visitor industry, and for tourism (7%) based on recent experience and other independent forecasts for St. Kitts and Nevis (Coopers-Lybrand, 1983; TTCI, 1981), and the payoffs expected from accessing the Southeast Peninsula.

Despite the high level of aggregation and conjecture involved, these provisional projections suggest a future (2006) St. Kitts and Nevis economy based on Government activities and the lead private sector, tourism, in which services control roughly 75% of Gross Domestic Product. The figures further indicate that the transition from an agriculture/sugar base -- which declines 10 percentage points over the period -- is accomplished primarily by increases in tourism (+12%) and, secondarily, in construction (+4.4%). Sectoral distributions of employment were considered too speculative to forecast because only incomplete total employment figures are available locally (GSKN, Department of Labour, 1985) and because estimates of unemployment vary widely, from over 30% (Chameleon Press, 1984) to 19% (USAID, 1985: Table 2).

#### A.4 TOURISM

##### A.4.1 Product Characteristics

Tourism in St. Kitts and Nevis is a relatively limited but highly dynamic sector. With few exceptions, it has developed from a small base of family-managed properties and guest houses/second homes (GSKN, 1982), and is now considered, like several other Eastern Caribbean countries, a new Caribbean destination (TTCI, 1981). Amenities include unspoiled scenic land and seascapes, abundant wildlife, unique historic sites like the Brimstone Hill Fortification in St. Kitts and Alexander Hamilton's birthplace in Nevis, two-island excursions, limited water sports, golf/tennis, hiking/horse riding, an uncrowded ambience and an hospitable host population. Traditionally, the islands have appealed to wealthy, older, repeat tourists, but the visitor mix is changing as the result of recent additions to hotel capacity in the Frigate Bay Area of St. Kitts, as well as significant improvements in air and sea infrastructure.

Presently, St. Kitts enjoys direct air access to North America and (from Miami) Europe. Nevis is less accessible and served primarily by commuter lines from regional gateways in the U.S. Virgin Islands, Puerto Rico, St. Maarten and Antigua. Both oval-shaped islands are fringed with a circumferential road network. St. Kitts has a deep water port and has become one of the fastest growing ports of call for Caribbean cruise ships. This is partly due to its proximity to Puerto

Table A-8. Tourist arrivals in the Caribbean (thousands).

	1970	1980	1981	1982	1983	1984	%Change	
							84/83	70/84
OECS COUNTRIES	177.2	314.5	296.3	292.7	325.1	382.0	+17.5	+ 8.3
Anguilla	1.0	5.7	6.2	6.7	7.8	10.8	+37.8	+70.0
Antigua & Barbuda	63.4	86.6	84.7	87.0	101.1	129.1	+27.7	+ 7.4
Dominica	13.5	14.4	15.9	19.0	19.6	22.2	+13.2	+ 4.6
Grenada	30.3	29.4	25.1	23.2	32.5 <sup>1</sup>	39.5	+21.7	+ 2.3
Montserrat	9.5	15.4	15.6	15.0	14.3	15.9	+11.0	+ 7.1
St. Kitts/Nevis	13.5	32.8	35.5	34.5	34.3	39.8	+16.3	+13.9
St. Lucia	29.5	79.7	68.6	70.2	77.8	86.2	+10.9	+13.7
St. Vincent & Gren.	16.4	50.4	44.7	37.1	37.7	38.5	+ 2.0	+ 9.6
OTHER CARICOM	591.6	1028.1	1010.0	1028.9	1148.7	1249.5	+ 8.8	
Barbados	156.7	369.9	352.6	303.8	328.3	367.7	+12.0	
Belize	42.0	63.7	64.2	67.3	64.2	88.4	+37.7	
Jamaica	309.1	395.3	406.4	467.8	566.2	603.4	+ 6.6	
Trinidad & Tobago <sup>2</sup>	84.1	199.2	186.8	190.0	190.0	190.0	-	
NETHERLANDS ANTILLES (289.1)	577.8	616.7	638.3	596.9	690.2	+15.6		
Aruba	75.0	188.9	221.3	220.2	195.2	210.2	+ 7.8	
Bonaire <sup>2</sup>	7.4	25.2	28.7	30.3	27.8	30.0	+ 7.9	
Curacao <sup>2</sup>	106.6	184.7	176.3	174.4	110.6	130.0	+17.5	
St. Maarten	100.0	179.0	190.4	213.4	263.3	320.0	+21.5	
BAHAMAS	891.5	1181.3	1030.6	1101.1	1239.8	1340.0	+ 8.1	
BERMUDA	302.3	491.6	429.8	416.6	446.9	417.5	- 6.6	
FRANCE (D.O.M.)	80.6	314.9	289.8	365.6 <sup>1</sup>	370.0	347.3	-6.1	
Guadeloupe	47.2	156.5	132.8	189.4 <sup>1</sup>	194.0	163.5	-15.7	
Martinique	33.4	158.5	157.0	176.2	176.0	183.8	+4.4	
U.S. TERRITORIES	1460.8	2007.4	1917.1	1903.7	1858.0	1897.5	+2.1	
Puerto Rico <sup>2</sup>	1088.4	1627.4	1573.4	1563.7	1513.0	1530.0	+1.1	
U.S. Virgin Islands	372.4	380.0	343.7	340.0	345.0	367.5	+6.5	

Table A-8. Tourist arrivals in the Caribbean (thousands). (continued)

	1970	1980	1981	1982	1983	1984	%Change	
							84/83	70/84
OTHER COUNTRIES	447.0	1277.1	1313.0	1360.4	1380.0	1437.3	+4.1	
British Virgin Is.	33.5	97.0	109.6	113.7	118.9	121.5	+2.2	
Cayman Islands	22.9	120.2	124.6	121.2	130.8	148.5	+13.6	
Costa Rica <sup>2</sup>	154.9	345.5	333.1	371.6	326.1	330.0	+1.2	
Dominican Rep. <sup>2</sup>	63.0	301.1	339.3	341.2	380.0	400.0	+5.3	
Haiti <sup>2</sup>	33.7	138.0	139.2	135.0	150.0	160.0	+6.7	
Suriname <sup>2</sup>	20.0	48.4	54.3	51.6	50.0	50.0	-	
Turks & Caicos Is.	2.0	11.9	12.3	13.3	14.2	17.3	+21.5	
Venezuela <sup>2</sup>	117.0	215.0	200.0	212.8	210.0	210.0	-	
TOTAL	4241.0	7193.0	6903.0	7107.0	7365.0	7761.0	+5.4	

<sup>1</sup> New series.

<sup>2</sup> Includes estimates by CTCRC.

Source: CTCRC, 1985.

Rico and Florida as a convenient day-stop on a seven-day tour, and partly due to the origination of new smaller cruise vessels in the nearby U.S. Virgin Islands (Towle, et al., 1985).

Distinct features or constraints which define unique tourism elements of St. Kitts and Nevis include: (1) a regionally high proportion of visitors overnighiting in second home accommodations, but a regionally low proportion overnighiting in hotel accommodations, (2) a regionally high share of package visitors (TTCI, 1981), and (3) unusually low hotel occupancy rates and length of stay, which is a function of the industry's narrow facility/amenity base and "emerging" status. Other related constraints in the competitive Caribbean context include: less convenient air access; limited facility development (TTCI, 1981); below average beach quality, nightlife, and duty-free shopping or handicrafts; lack of strong destination identity in the prime North American and European markets; and limited promotional resources and experience (Beekhuis, 1985). The Government's policy to open up the unique recreational assets of the Southeast Peninsula is a deliberate attempt to address many of these internal supply constraints.

#### A.4.2 Performance

Table A-8 reviews Caribbean overnight visitor arrivals between 1970-1984. In both the larger region and within the Eastern Caribbean, small, "emerging" destination contexts, St. Kitts and Nevis performed considerably above average with a 14% annual growth rate. As Bloomestein (1985) has observed elsewhere in the region, the expansion of hotel room capacity has closely paralleled this rapid growth in overnight visitors to St. Kitts and Nevis. According to Table A-9, between 1972-85 hotel rooms and total accommodations available increased 13% and 15%, respectively. Roughly three-fourths of these rooms are located on St. Kitts, and two-thirds of these are sited in the Frigate Bay area at the northwest entrance to the Southeast Peninsula (Towle, et al., 1985).

Another dynamic component of St. Kitts and Nevis tourism is cruise traffic. Since 1976, cruise passengers have risen over ten-fold from 3,056 (CTRC, 1985) to an estimated 36,000 (CTRC, 1986). Table A-10 indicates St. Kitts has become a growth standout in the region with visitor arrivals virtually continuing to double annually between 1980-1984. This striking performance is partly due to successful Government promotional efforts (World Bank, 1985) and partly the result of Caribbean cruise industry rationalization and a deliberate policy to access new destinations. Although recent doubling rates cannot continue for the long term, this tourism sub-sector should remain buoyant.

Table A-9. St. Kitts-Nevis hotel and guest room accommodations, 1972 - 1985.<sup>1</sup>

YEAR	HOTEL ROOMS	TOTAL ROOMS AVAILABLE <sup>2</sup>
1972	266	266
1974	288	-
1975	281	-
1976	296	-
1977	395	415
1978	430	502
1979	486	588
1980	479	581
1981	480	580
1982	493	590
1983	585	706
1984	596	707
1985	718	798
Ave. annual growth	13.1%	15.4%

1 Sources: CTRC, 1984 and 1985; Towle, et al., 1985; GSKN, Annual Digest, 1982.

2 Includes apartments, beach cottages, guest houses and second houses.

Table A-10. Cruise passenger arrivals (thousands).

	1980	1981	1982	1983	1984
Antigua/ Barbuda	107.1	113.2	66.8	52.0	66.4
Aruba	73.4	55.0	51.1	39.2	30.2
Bahamas	577.6	596.9	719.6	854.1	907.8
Barbados	156.5	135.8	110.8	102.5	99.2
Bermuda	117.9	104.7	124.2	120.8	111.4
Bonaire	2.9	12.0	6.8	0.3	n.a.
British Virgin Islands	38.1	33.4	28.3	13.9	24.8
Cayman Islands	60.9	78.0	158.3	177.2	203.6
Costa Rica	0.9	n.a.	n.a.	n.a.	n.a.
Curacao	169.0	128.4	110.0	107.1	121.0
Dominica	7.4	5.5	2.4	6.1	3.2
Dominican Republic	183.1	162.4	142.6	n.a.	n.a.
Grenada	145.6	77.6	62.1	50.2	34.2
Guadeloupe	49.7	25.2	32.0	34.4	n.a.
Haiti	159.7	117.8	n.a.	n.a.	n.a.
Jamaica	133.4	139.7	194.4	209.6	230.6
Martinique	203.4	202.5	168.0	158.6	135.5
Montserrat	4.1	5.1	9.1	3.6	4.3
Puerto Rico	501.1	531.2	444.1	411.2	436.0
St. Kitts & Nevis	5.8	10.9	11.1	22.8	34.0
St. Lucia	59.0	18.9	33.8	33.3	37.2
St. Maarten	105.5	106.4	92.9	73.0	n.a.
St. Vincent & the Gren.	32.5	33.4	28.9	34.4	64.0
Trinidad & Tobago	6.4	n.a.	6.0	2.9	4.6
U.S. Virgin Islands	691.4	695.2	586.2	632.8	657.5
Venezuela	201.7	179.6	136.2	n.a.	n.a.
TOTAL	3805	3590	3455	3550	3720

Source: CTRC, 1985.

Table A-11. Composition of visitor demand, 1980 - 1984<sup>1</sup>.

	1980	% 1980	1981	1982	1983	1984	1985	% 1985
U.S.A.	12,031	36.7	12,345	10,841	9,858	14,566	15,787	33.2
Canada	1,760	5.4	2,050	2,451	2,072	2,488	7,737	16.3
Europe	2,783	8.5	3,167	3,177	3,310	3,512	3,881	8.2
Carib. <sup>2</sup>	12,672	38.7	13,882	14,755	15,234	15,913	14,607	30.7
Other	3,505	10.7	3,908	3,351	3,800	3,325	5,535	11.6
TOTAL	32,751	100.0	35,352	34,575	34,274	39,804	47,547	100.0

1 Sources: CTCRC, 1985; GOSK, Annual Digest, 1982; World Bank, 1985; IRF estimates.

2 Includes Kittitians and Nevisians resident in U.S. Virgin Islands and the Netherland Antilles.

#### A.4.3 Visitor Profile and Other Characteristics

Another unique aspect of St. Kitts and Nevis tourism is the relatively low proportion of North American tourists and the relatively high ratio of Caribbean visitors. According to Table A-11, U.S. and Caribbean arrivals each constituted roughly one-third of the total. Over the 1980-1985 period, the share of North Americans (U.S. and Canada) has risen favourably from 42% to 50%, primarily because of the rapid economic upturn in 1983 and the establishment in 1985 of back-to-back Canadian charters at the Jack Tar Hotel in Frigate Bay, the only St. Kitts and Nevis property servicing over 100 rooms. Between 1984-1985, Canadian visitors more than tripled because of this business. The very high Caribbean proportion is due to off-island emigrant St. Kitts and Nevis nationals returning temporarily from work/education in other surrounding islands. For example, in 1982 over four-fifths of all St. Kitts and Nevis Caribbean visitors returned from only three close-by territories: U.S. Virgin Islands; Netherland Antilles (mostly St. Maarten); and Antigua.

Several distinct tourism behaviors flow from this unique visitor mix. For example, the large share of West Indian returnees with family ties in St. Kitts and Nevis results in a heavy use of private accommodations with friends, relatives, or in their own apartments/villas. In comparison with other islands for which the private accommodation ratio is available, St. Kitts and Nevis ranks at the top with a ratio of 53% (see Table A-12). In addition, there is an extremely sharp island division in the visitor demand pattern. For example, a 1982 breakdown shows that West Indians comprise over 95% of total visitors frequenting the smaller-scale accommodations on Nevis, while 95% of all North American and European visitors to St. Kitts and Nevis stay in St. Kitts where the major hotel properties are located (GSKN, Annual Digest, 1984). An estimated 70% of all North American and European tourists stay in hotel accommodations.

The visitor mix and high private accommodation ratio may partly explain why St. Kitts and Nevis persistently records short length of stay averages (5-6 nights) and chronically low (less than 30%) annual average hotel occupancy rates. According to Table A-13, St. Kitts and Nevis ranked lowest in occupancy in comparison with 17 other Caribbean destinations between 1980-1984. Such low levels seem suspect on two grounds: no other country in the sample recorded a rate lower than 40% in any year over the five-year period; local St. Kitts and Nevis observers allege widespread under-reporting to avoid hotel room tax liability.

To test the validity of reported occupancy rates with 1984 data, total hotel visitors were estimated using the formula drawn from McElroy and Tinsley (1982):

$(R \times B \times Y)/L = H$  where

R = average annual occupancy rate of 25.9

B = <sup>from Table A-13</sup> total number of hotel beds =  $(596 \times 2)$   
1192 (see Table A-9)

Y = total number of nights per year of 365

L = average length of stay of 5.7 from CTRC, 1985

According to this formula, the number of overnight hotel visitors in 1984 is estimated to be:

$$(.259 \times 1192 \times 365)/5.7 = 19,769$$

These hotel guests represent 50% of the total 39,804 stay-over visitors in 1984, a ratio reasonably comparable with the 50% non-hotel/private accommodation share of overnight visitors reported in Table A-12. Although these results tend to confirm the low occupancy rates registered for St. Kitts and Nevis, such estimates are highly sensitive to the accuracy of the other estimated parameters, especially the rough 50/50 hotel/private accommodation distribution.

For purposes of this study, because of the similar scale and type of facility envisioned for the Southeast Peninsula, the occupancy experience of the Frigate Bay properties is more instructive than an island-wide average. According to interviews with local hoteliers and data reported in the Beekhuis (1985) study, roughly 70% of the Frigate Bay hotel rooms achieved occupancy rates above 50% during the past two years, and half of the total exceeded 60% year-round occupancy. These rates are more comparable with Caribbean norms and seem more reasonable and valid for estimating projected levels for future facilities in the Southeast Peninsula.

Finally, the peculiar St. Kitts and Nevis visitor mix may, to some extent, reduce seasonality. According to Table A-14, the percentage of stay-over arrivals during the December-April high season averaged 54% between 1978-1984. This figure is fairly representative of other regional experiences (CTRC, 1985). However, a 1982 breakdown indicates 66% of all hotel over-nighters visited during the winter season (GSKN, Annual Digest, 1984). This peak demand pattern is reflected in contrasting island hotel occupancy rates for the winter versus the summer (May-November) seasons. Throughout the 1975-1982 period, seasonality has been particularly marked in St. Kitts (see Table A-15), where three-fourths of St. Kitts and Nevis' total hotel rooms are located. Such summer downswings undoubtedly have been the source of temporary room closures, employee layoffs, shorter work weeks and/or work rotations. On the other hand, the heavy influx of returning West Indian workers mainly in the summer months -- 53% during June-August in 1982 (GSKN, Annual Digest, 1984) -- may stabilize these seasonal fluctuations.

Table A-12. Tourists staying in private accommodations in 1984 (percentage of total tourist arrivals).

Aruba	7
Barbados (1983)	33
British Virgin Islands	8
Cayman Islands	20
Dominica	28
Montserrat	37
St. Kitts and Nevis (1982)	53
St. Lucia (1983)	19
St. Vincent and the Grenadines	47
U.S. Virgin Islands (1981)	15

Source: CTRC, 1985.

Table A-13. Room occupancy rates (percentages).<sup>1</sup>

	1980	1981	1982	1983	1984
Aruba	77.4	86.2	77.2	74.1	79.6
Bahamas	69.1	59.8	58.2	63.3	n.a.
Barbados <sup>2</sup>	68.6	57.5	48.8	51.8	58.0
Bermuda <sup>2</sup>	73.9	60.1	58.8	63.9	59.0
British Virgin Islands	52.1	54.7	49.3	52.1	49.9
Cayman Islands	69.1	59.9	51.1	55.4	59.4
Curacao	70.6	72.6	64.9	47.5	51.4
Grenada	n.a.	n.a.	n.a.	n.a.	46.4
Guadeloupe	n.a.	61.0	70.1	71.5	67.7
Jamaica	41.6	41.5	53.3	58.6	60.4
Martinique	n.a.	56.3	63.5	58.4	60.8
Montserrat	43.9	48.0	35.9	34.5	46.4
Puerto Rico	61.0	62.8	58.2	62.9	66.9
St. Lucia	61.9	50.1	52.5	57.3	67.7
St. Martin	n.a.	77.4	48.4	63.7	n.a.
St. Kitts	28.7	29.0	23.2	19.4	25.9
Nevis	18.4	22.5	19.3	n.a.	n.a.
Trinidad and Tobago	n.a.	n.a.	n.a.	60.7	49.4
U.S. Virgin Islands	64.0	57.0	58.1	60.0	62.8

Source: CTRC, 1985; Beekhuis, 1985.

<sup>1</sup> Rooms occupied as a percentage of rooms available.

<sup>2</sup> CTRC estimate for 1984.

Table A-14. Monthly tourist arrivals, by air only.

MONTHS	1978	1980	1981	1982	1983	1984	% 84 TOTAL
January	2050	3395	3409	3907	2847	3373	8.5
February	2775	3668	3596	3565	2935	4227	10.6
March	2651	3188	3570	3077	2861	3621	9.1
April	1790	2531	3062	3032	2272	3167	8.0
May	1358	1860	2035	2072	1830	2803	7.0
June	983	1996	2303	2175	2210	2582	6.5
July	1310	3128	3475	3505	3139	4061	10.2
August	1345	2689	2860	2750	2522	3475	8.7
September	848	1468	1551	1825	4941	2183	5.5
October	1060	1660	1766	1801	1877	2173	5.5
November	1401	1993	2374	1878	2252	2493	6.3
December	2655	4859	5351	4988	4598	5646	14.2
TOTAL	20234	32432	35352	34575	34274	39804	100.0
% Dec. - Apr.	59	54	54	54	50	50	

Source: CTRC, 1985.

Table A-15. Room occupancy rates by island, 1975-1982.

YEAR	December-April		May-November	
	St. Kitts	Nevis	St. Kitts	Nevis
1975-76	30.9	21.2	21.6	7.6
1976-77	25.5	17.2	24.7	11.1
1977-78	41.9	30.2	15.8	8.2
1978-79	38.0	21.7	19.8	10.3
1979-80	40.4	30.9	19.7	9.4
1980-81	35.0	30.1	22.9	14.9
1981-82	27.7	25.0	18.5	13.6

Source: GSKN, Annual Digest, 1982.

#### A.4.4 Visitor Expenditures

Table A-16 reports published estimates for daily and total annual expenditures for the various categories of St. Kitts and Nevis visitors: (1) cruise passengers, (2) excursionists, i.e., other day-trippers arriving by air or private yacht, (3) hotel over-nighters, (4) private home visitors, (5) and business people who stay in hotels. In the absence of a local expenditure survey, these figures, developed by the Planning Unit and IMF consultants, provide the only base for estimating visitor spending effects. These numbers indicate -- on a per day basis -- that hotel tourists and business people spent roughly 2.6 times more than private home visitors (US\$85 vs. US\$33), while the latter spend almost twice as much per day as cruise and excursionist day-trippers.

Between 1978-1984, gross annual expenditure flows of all visitor types combined (see Table A-16) increased 26% per year. Assuming a rough 10% estimate of inflation over the same period, this yields a very robust 16% increase in real terms, similar to the performance of other small Eastern Caribbean destinations (see CTRC, 1985, Table 20). Above average growth rates were recorded for cruise, private home and business visitors. The highest yearly rises were for cruise passengers, partly reflecting the annual visitor doubling mentioned earlier. Overall, however, the most significant spending streams derived from hotel and private home tourists. These two groups accounted for 46% and 37%, respectively, or 83% combined of the 1984 projected total expenditures. Although only estimates, these data emphasise the overwhelming importance of these two visitor types in the St. Kitts and Nevis tourist economy. The unusually strong performance of private home visitors, mainly returning West Indian workers, is primarily due

Table A-16. Average per day and total annual expenditures by type of visitor, 1978-1984.

	1978	1979	1980	1981	1982	1983	1984 <sup>1</sup>
<u>Average expenditure/day</u> (in U.S. dollars)							
Cruise Ship	9.9	11.0	13.0	14.3	15.0	16.5	17.5
Excursionist	19.8	22.0	26.0	28.6	30.0	31.5	33.0
Hotel	49.5	55.0	64.9	71.4	75.0	80.5	84.5
Private home	9.9	11.0	13.0	14.3	15.0	16.5	17.5
Business	52.9	58.7	69.3	76.2	80.0	84.0	88.2
(in millions of U.S. dollars)							
<u>Total expenditures</u>	<u>5.16</u>	<u>6.82</u>	<u>8.02</u>	<u>9.85</u>	<u>10.95</u>	<u>11.10</u>	<u>13.32</u>
Cruise Ship <sup>2</sup>	0.08	0.06	0.06	0.13	0.14	0.32	0.37
Excursionists	0.03	0.03	0.04	0.03	0.03	0.03	0.03
Hotel	2.77	3.79	4.27	5.47	6.28	5.14	6.15
Private home	1.61	2.00	2.37	2.91	3.37	4.10	4.96
Business	0.67	0.94	1.28	1.31	1.13	1.51	1.81

Sources: St. Kitts-Nevis Planning Unit and International Monetary Fund estimates, as reported in World Bank, 1985.

1 Projected.

2 Assuming that 85% of passengers leave ship.

to their longer average stays -- 12.5 days versus 5-6 days for hotel tourists (World Bank, 1985).

#### A.4.5 Tourism Projections

Based on the above review of past performance, this section presents linear annual growth rates over the 20-year forecast period for stay-over and cruise ship visitors and estimated total visitor expenditures. These projections provide an industry-wide context for developing specific forecast scenarios for facilities/recreational activities to be sited in the Southeast Peninsula. In general, the projections are more conservative than the buoyant benchmark rates achieved in recent years because of future uncertainties. For example, these projections make no allowance for substantial increases in occupancy rates, stemming from large volumes of convention and seminar related tourism which would be encouraged by United States tax concessions under the Caribbean Basin Initiative (CBI).

Regarding stay-over visitors, it is assumed that Southeast Peninsula access and facilities will attract a greater proportion of hotel visitors to the St. Kitts and Nevis demand mix. Traditionally, such over-nighters have been North American (U.S. and Canadian) and European tourists. Between 1978-85, these visitors have increased from 11,500 to 47,500 (CTRC, 1984 and 1985), realising a compound annual growth rate in excess of 20%. This considerably exceeds total stay-over visitor arrivals which grew 11% per year since 1978. On this basis, but constrained by realism, it is projected that total stay-over visitors will increase by roughly 7-8% annually while North American/European tourists will average 10% per year and increase their share of total arrivals to 60 percent. Given the declining share of West Indian visitors expected from the reduced emigration rates in the demographic forecast, these changes imply an average annual West Indian growth rate of 7% and an average stay-over visitor share of 40%. A conservative 7-8% rate is also assumed for cruise passenger arrivals. Since these shifts in visitor composition should have only minor effects on total tourist expenditures (because the differential average length of stay for West Indian versus North American/European tourists compensates for different daily spending rates), visitor expenditures are also forecast to increase apace with stayover and cruise arrivals.

These projections are within the medium forecast of the North American Demand Study (TTCI, 1981). They represent a balance between the past buoyant St. Kitts and Nevis tourist experience and the risk limits inherent in an industry largely controlled in the long run by external events. Additionally, they are consistent with the 7% annual Gross Domestic Product growth rate forecast for the leading tourist sector in the macroeconomic projections (see Table A-7), given the expected fleshing-out of the tourism base projected from Southeast Peninsula access and development.

## A.5 METHODOLOGY FOR CONSTRUCTING DEVELOPMENT SCENARIOS

In order to construct the development scenarios, three principal sub-analyses were conducted: (1) twenty year tourism development models, (2) private investment models for construction and management of typical resorts and hotels, and (3) public infrastructure models examining various construction and financing options for major public capital investments in the Southeast Peninsula. In addition, we have performed ancillary studies of hotel/condo and public construction labour impacts, and day-tripper (visitor and resident) spending and impacts.

For all elements of the economic analysis we assume constant (1986) prices. We assume foreign exchange rates remain constant over the term of the analysis, and other than those statements referred to directly in each analysis, we have made no assumptions regarding future inflation rates or interest charges. Listed below are the other assumptions employed in these analyses and their respective justifications.

### A.5.1 Access Road and Water System Construction and Fiscal Recovery

Two road construction scenarios are presented: (1) for a 6 kilometer, EC\$13 million road to White House Bay; (2) a 10 kilometer, EC\$15 million road, including the Great Salt Pond circumferential. Similarly, the water system analysis includes a low cost, (EC\$5.5 million) and a high cost (EC\$9.8 million) option. Consistent with other planning assumptions, both projects are costed exclusive of land values (presuming a landowner donation of or peppercorn easement for the right-of-way will be negotiated).

It is expected that the construction projects will be completed in 12 months, i.e., within the first year. Based on the Coopers-Lybrand (1983) estimates, confirmed by interviews with developers (March 1986), it is assumed that local value-added represents 25% of the total road/utilities cost distributed 20%/80% between local materials/labour costs.

For most construction projects, skilled labour costs are estimated at 12% of total project cost, while unskilled labour is 8%. Annual wages are assumed to be between EC\$12,500 and \$15,000 for skilled labour (at EC\$250 to \$300 per week for 50 weeks) and EC\$5,000 to \$6,250 for unskilled workers. (The exact parameter depends on the nature of the job. For example, skilled worker wages in the public sector are assumed to be less than wages for skilled workers working on short-term capital construction projects.)

The fiscal analysis for both the road and the water system examines the annual maintenance and periodic (6 year) major repair costs of the projects plus the annual amortization of the project, based on two alternative financing models. The first model assumes funds are lent

for 20 years with a 3.5% rate during the first five year grace period and a 6% rate during the remaining 15 years. The second financing model assumes a concessionary term of 40 years with a ten year grace period at 2% and a 3% rate during the remaining 30 years.

Recovery derives from three primary sources: (1) the hotel room tax of 7% for visitors attracted by Southeast Peninsula developments, (2) the visitor exit tax of \$EC13.50, and (3) other taxes induced by construction and visitor activity stimulated by Southeast Peninsula development. These indirect taxes are derived by estimating the Gross Domestic Product contributions of Southeast Peninsula construction/visitor activities and estimating the gross total taxes minus the hotel and exit revenues associated with that level of activity. Accordingly, the Gross Domestic Product contribution of construction and visitor spending is calculated by using average gross spending-to-Gross Domestic Product multipliers of .30 and .40 respectively, conservatively adapted from McElroy and Tinsley (1982) but in line with estimates reported in Mathieson and Wall (1982). Although the tax take (minus hotel occupancy and exit fees) associated with Gross Domestic Product in St. Kitts and Nevis in recent years is roughly 20% (World Bank, 1985), a lower average figure of 10% is employed here similar to estimates in Aruba, St. Lucia, and Antigua (Seward and Spinrad, 1982) because of the past pattern of fiscal erosion in St. Kitts and Nevis. These assumptions yield an "other tax" multiplier of roughly 4% (.40 X .10) on visitor expenditure and 3% (.30 X .10) on construction spending. In addition, it is assumed that 2% of expenditures by cruise ship tourists visiting the Southeast Peninsula provide other indirect taxes.

#### A.5.2 Hotel Construction Impacts

The employment generated by this tourism investment is assumed to average 1.8 person-years per hotel room, 5.1 person-years per condo, and 9.6 person-years per second home. These estimates are based on 28.5% local value added adapted from the 25.1% in Coopers-Lybrand (1983) distributed 80%/20% to local labour/materials content, or 22.5%/6% of total construction value. For a single hotel room costing EC\$79,800, this generates EC\$17,955 in annual wages (EC\$79,800 X .225) split 15%/7.5% between skilled/unskilled labour yielding roughly 0.8 skilled worker and 1.0 unskilled workers. For condos costing EC\$202,770, these estimates yield EC\$34,500 in skilled wages for 2.4 workers and EC\$17,500 in unskilled wages for 2.8 workers. The same estimates for second homes costing EC\$327,750 result in 4.4 skilled and 5.2 unskilled workers.

The Gross Domestic Product contributions and tax revenue flowing from hotel and resort construction are projected to be the same as in the road construction analysis -- Gross Domestic Product equals 30% of gross investment expenditure, and tax equals 10% of Gross Domestic Product value -- despite higher local value added, i.e., 32% of total cost versus 25% in the road case. This relatively conservative pro-

cedure is used to account for newly developing techniques such as imported modular construction and the likely impacts of potentially "lumpy" investment phasing on reduced purchases of local labour/materials.

### A.5.3 Visitor Expenditures and Economic Impacts

Three kinds of visitors are expected to frequent Southeast Peninsula amenities and facilities: (1) stay-over guests in Southeast Peninsula hotels/condos, etc.; (2) tourist day-trippers from cruise ships, from other St. Kitts-Nevis facilities, and other excursionists (by yachts, etc.); and (3) residents. This section develops estimates for average daily on-island expenditures for these three groups, and provides calculations for direct and indirect tourist employment.

Determining average daily stay-over spending requires estimating hotel room expenditures, non-room (food, beverages, etc.) hotel expenditure, and other non-hotel on-island expenditure (transport, gifts, etc.). Table A-17 reports current 1985/86 winter/summer hotel rates for single/double accommodations at five Frigate Bay properties since they are assumed to exhibit the quality and diversity of future Southeast Peninsula facilities. Average rates are calculated for single/double occupancy across the two seasons, and a weighted average rate is developed which assumes that 50% of overnighters to St. Kitts and Nevis visit in the winter (see Table A-14). These procedures yield an effective average year-round rate of EC\$364.50 per hotel room per visiting party. The spending party in the Southeast Peninsula is assumed to be 1.7 persons, slightly higher than the current average St. Kitts and Nevis level of 1.6 persons.

To account for the relatively high prevalence of package tours in St. Kitts and Nevis requiring rate discounting and travel operator commission, the daily rate is deflated 20%, yielding EC\$292 per day per room per party. It is further assumed that room expenditures represent 64% of total daily hotel expenses. This yields total daily hotel spending per party of EC\$456 or EC\$268 per person. This ratio is approximately the same as obtained in St. Lucia in 1978 (Seward and Spinrad, 1982), a tourist economy similar in size and structure to St. Kitts and Nevis. It is higher than that recorded for Antigua partly because it includes some meals/other services (i.e., European Plan, etc.).

Finally, it is assumed that hotel expenditures represent 71% of total on-island expenditures, a rate between those Seward and Spinrad recorded for St. Lucia (73% in 1978) and the U.S. Virgin Islands (68% in 1979). This results in a daily per person expenditure of EC\$378 (or \$643 per day per party). This is distributed roughly EC\$270 in hotel and EC\$108 outside hotels. This total daily per person expenditure of EC\$378 is approximately 35% higher than the 1984 average spending rate of EC\$230 for all of St. Kitts and Nevis (plus 2 years of inflation to EC\$278) reported in Table A-16. This differential seems reasonable

Table A-17. Projected average year-round daily rate of Southeast Peninsula hotel rooms.

Property	Winter <sup>1</sup> Single/Double	Summer Single/Double
Frigate Bay Beach	\$190/310 <sup>2</sup>	\$90/150
Island Paradise	86/129	-
Leeward Cove	125/200	90/125
Jack Tar	150/250	-
Sun 'N' Sand	89/118	50/63
Average	128/201	77/133
Occupancy adjustment (.60 double and .40 single)		
	Winter (128 x .40) + (201 x .60) = 51.2 + 120.6 = 171.8	
	Summer (77 x .40) + (133 x .60) = 30.8 + 79.8 = 110.6 <sup>3</sup>	
Weighted average based on 50% winter/50% summer		
	(171.8 x .50) + (110.6 x .50) = 85.9 + 55.3 = \$141.2 <sup>4</sup>	

<sup>1</sup> Source: St. Kitts-Nevis Tourist Board, 1986.

<sup>2</sup> All figures in US dollars.

<sup>3</sup> Source: Coopers and Lybrand, 1983.

<sup>4</sup> Source: See Table A-14. In Eastern Caribbean dollars, this represents EC \$364.50 per hotel room per visiting party.

given the expected superior quality/price of projected Southeast Peninsula facilities and the relatively high-income North American/European visitors forecast to frequent them. Although the estimated average per party room expenditure represents a relatively high 46% (EC\$292/EC\$643) of total expenditure, this is to be expected for some time in St. Kitts and Nevis, as long as package tours remain important and until the tourist plant becomes more diversified.

Cruise visitors to St. Kitts and Nevis purchase primarily ground transportation for scenic tours, meals, gift items and souvenirs. In the absence of any detailed local expenditure surveys, it is possible to estimate a rate by establishing a relation between stay-over/cruise rates from the experience of other islands where surveys have been conducted. According to Seward and Spinrad (1982), the daily stay-over/cruise relation is roughly 2/1 in Antigua and Aruba, and 3/1 in St. Lucia. Because of the lack of amenities/opportunities in St. Kitts and Nevis, a 4/1 ratio is assumed. Since the average all-St. Kitts and Nevis overnighiter daily expenditure constructed from 1984 IMF figures (see Table A-16) is estimated to be EC\$292 in 1986, average daily cruise visitor spending is estimated at EC\$70 per passenger.

Little information is available on the spending patterns of excursionists. In 1984 they represented less than 3% of all cruise visitors and were responsible for less than 0.3% of total tourist expenditure. Because of this negligible contribution, and in view of the conservative approach adopted in this study, their explicit detailed impacts are excluded in the Southeast Peninsula analysis. The same assumption is followed regarding resident visitors who will frequent Southeast Peninsula amenities and facilities and about whom even less is known.

Finally, with respect to developing employment generated by visitor spending, the best estimates of tourism-induced employment are based on labour-to-room ratios. Two surveys of recent literature -- Mathieson and Wall, 1982; Seward and Spinrad, 1982 -- suggest one employed worker per hotel room generates another worker directly employed in other primarily tourist establishments/activities -- taxis, restaurants, gift shops, and so on. These two directly employed workers, through their job-induced and consumption-spending activities, create additional induced or indirect employment, but the extent varies with the size of the economy and/or the tourist sector, various definitions used, and so on. Boxhill (1982) estimates an average of 1.3 induced jobs or more, while Young (1973) estimates considerably fewer because of their part-time nature (seasonality) and the negative impact tourism has on employment in other sectors.

Here induced employment is assumed to be 0.4 jobs, corresponding to the young and emerging status of the St. Kitts and Nevis visitor industry. Thus, total direct and indirect tourist employment is estimated to be 2.4 workers per room. Given the 798 rooms available for the 1985/86 season in St. Kitts and Nevis (see Table A-9), this em-

ployment ratio yields a total of 1,915 tourist jobs (798 X 2.4). This figure represents roughly 15% of total current employment estimated to be approximately 13,000. This number is based on a 1986 labour force of 16,235 (see Table A-3) and the commonly reported 20% unemployment rate for St. Kitts and Nevis.

#### A.5.4 Hotel Profitability Analysis

The purpose of this analysis is to illustrate the potential effects on private investment in the Southeast Peninsula, if cost and revenue factors are roughly equivalent to the average performance of hotels and resorts in the Eastern Caribbean. The model is not intended to evaluate the economic feasibility of specific future hotels. In keeping with our conservative approach, a first general assumption is made that Southeast Peninsula properties will perform above the Caribbean average because of (1) the general attractiveness of newer facilities, (2) the special locational amenities of the Southeast Peninsula, and (3) the relatively affluent market segments expected, i.e., high return rates. Other specific assumptions include: (1) that there are no significant hotel income taxes due to existing St. Kitts and Nevis incentive legislation and (2) that there are economies of scale based on hotel utilization, i.e., different occupancy rates.

In this last regard, an average year-round occupancy rate of 40% is assumed in the first three years following construction. The rate rises to 50% over the next three years and averages 60% thereafter. These estimates are based on observation of new hotel and occupancy behavior throughout the Caribbean region (Seward and Spinrad, 1982) and on the performance of the Frigate Bay properties in particular. For example, the 60% rate for a mature facility is based on often-repeated estimates of 90% winter and 40% summer occupancies for such facilities. These figures generate a year-round rate of approximately 60% where 50% of all visitors come in the five-month winter season (see Table A-14). Thus:

Average Year-round Occupancy:

$$\frac{\text{winter}}{(.90 \times 5/12)} + \frac{\text{summer}}{(.40 \times 7/12)} = 61\%$$

Regarding the respective occupancy rates for condominiums and second homes located in the Southeast Peninsula over the 20-year forecast period, casual observation elsewhere and particular expectations about the quality of the Southeast Peninsula suggest an annual 40% rate for condos -- based on roughly 5 months of full occupancy for an average of two people -- and an annual 30% average rate for second homes based on roughly 3.5 months full occupancy for an average of three people.

Table A-18 provides estimates of hotel revenues by source based on previous analysis and constructs a likely distribution of operating income adapted from published figures on Aruba and Antigua. In the

Table A-18. Estimates of Southeast Peninsula hotel revenue by expenditure category and distribution of operating income (\$US).

<u>Distribution of Revenue</u> <sup>1</sup>			<u>Distribution of Operating Income</u> (% Total)			
Department	Amount	% Total	Category	Aruba <sup>2</sup>	Antigua <sup>3</sup>	SEP <sup>4</sup>
Room	108 <sup>5</sup>	64	Payroll	30	23	23
Food/ Beverages	53	31	Cost of Goods (food/beverages)	15	20	20
Minor Depts. <sup>6</sup>	9	5	Other goods/Ser- vices <sup>7</sup>	19	25	22-25
TOTAL	170	100	Utilities	7	7	7
			Advertising	5	5	5
			Fixed expenses	24	20	23-20
			TOTAL	100	100	100

1 Per day per spending party of 1.7 persons per room.

2 Seward and Spinrad, 1982.

3 Adopted from Coopers-Lybrand, 1983.

4 IRF estimates.

5 Based on \$135 derived in Table A-17 less 20% for package discounts/tour fees.

6 Telephone, watersports, laundry, and other rentals. Taken from Coopers-Lybrand, 1983.

7 Includes replacement of linen, glassware, etc., repairs and maintenance, entertainment, legal, accounting, management fees, etc.

first case, daily hotel revenues are projected to derive principally from room rates (64%) and food/beverage sales (31%). In the second case, in comparison with Aruba, the cost of goods sold and other goods/services is expected to be higher because of less direct, more expensive and less frequent transport links to St. Kitts and Nevis (and the Southeast Peninsula); while payroll costs are projected to be lower given the relatively low-wage rates prevailing in St. Kitts and Nevis and the lack of a high-wage competitor to tourism like the petroleum industry in Aruba. In the latter case, the 23% hotel payroll cost is based on: (1) the operation of a relatively labour efficient facility; (2) a weighted average of skilled/unskilled (cooks/maids, etc.) wages up-dated from 1984 (Chameleon Press, 1984) to EC\$108 per week at five days per week for a daily average per worker of EC\$21.60; (3) an assumed EC\$5.40 (20%) for benefits; (4) 1 worker per room plus 1 worker in non-room (food/beverage) activities; and (5) another EC\$54.00 in management time per room computed from gross figures in Coopers-Lybrand (1983). These assumptions yield EC\$54.00 in daily wages per room plus EC\$54.00 in management fees for total daily payroll/management costs of EC\$108.00 or 23% of total (EC\$470) daily hotel revenue per room per party.

These estimates leave an operating income residual of 20-23% for fixed capital costs and profits. This range is based on the variable cost ratio of 22-25% for other goods/services. Under the assumption that hotel refurbishing (mainly furniture) takes place every 6-8 years, the higher 25% ratio will be employed, and fixed exposures for interest, depreciation, and profits will fall to 20 percent. If regular refurbishing is not assumed, or if it is unduly postponed (i.e., 12-15 years), the cost of other goods/services and fixed expenses will become 22% and 23%, respectively. Because casual observation suggests that renovation takes place sporadically throughout the region, and because the Southeast Peninsula facilities will be relatively new over the 20-year forecast period, this latter assumption will be primarily followed, although sensitivity analysis will be performed to determine what impact routine refurbishing has on annual hotel profitability.

#### A.5.5 Other Non-Hotel Southeast Peninsula Facilities

It is certain that over time the Southeast Peninsula will contain several non-hotel facilities in addition to second homes. These will undoubtedly include restaurants, scenic look-out installations, public beach and parking facilities, perhaps a marina complex involving a general store, provisioning and repair outlets, and other detached sporting establishments for horseback riding, boating, diving, and so on. For purposes of this analysis, however, concrete information is presently unavailable on the potential size and costs of such operations, the likely pattern of demand, and other input required in order to work up detailed revenue/cost/profitability estimates. It is assumed that such public and private facilities (1) will become part of the Southeast Peninsula landscape and enhance recreational access to

Southeast Peninsula amenities, and (2) that they will at least break even.

## A.6 ANALYSIS

Employing the assumptions discussed above, three categories of analysis were performed:

- Twenty Year Tourism Development Models for the Southeast Peninsula, including an examination of the overall impacts on St. Kitts. This one model includes three different tables which are used to illustrate different aspects of the growth of tourism.
- Private Investment Models, including twenty year internal rate of return analysis of four different hotel or resort alternatives. This model illustrates expected returns if Southeast Peninsula hotels perform no better than the average Eastern Caribbean resort.
- Public Investment Models of the costs associated with two different development options for construction of the Southeast Peninsula road and water system.

Each of these models was researched and tested extensively. For example, six completely different scenarios of the Twenty Year Tourism Development Models were fully implemented, and dozens of individual variables were tested to determine the model's sensitivity to specific conditions.

### A.6.1 Twenty Year Tourism Development Model

Two different tourism growth scenarios are presented in this analysis. The first model ("Early Development," Tables A-19, 20, and 21) assumes that three large (200 to 250 rooms) hotels will be built in the first three years after the completion of the Southeast Peninsula road. Thereafter, the tourism growth in the Southeast Peninsula will average about 100 rooms per year for the remainder of the 20 year period. This model results in five and ten year growth rates for tourism in all of St. Kitts of 23% and 15%. This growth rate is far too rapid to be assimilated by the St. Kitts economy and will result in inflation, spiralling wage increases, and large-scale immigration of workers from neighbouring islands. In addition, virtually all of the resort development -- and eventually landownership -- would be in the hands of outside financial interests.

A closer examination of the serious labour force impacts connected with the Early Development scenario is instructive. On the supply side, during the first five years of the forecast period, when the three major hotel facilities are scheduled for completion, the labour force is projected to increase by 900 (see Table A-3), and 400 more workers are expected to be released by the declining sugar industry (i.e., 2% of the current sugar work force of 4,000 per year for five years). On the demand side, the labour requirements to construct and staff the new facilities in the Southeast Peninsula are only projected to be approximately 2,000 workers by the fifth year. This exceeds by 700 the combined labour pool available from demographic growth and economic restructuring. Even the supposed unemployed reserve of 3,000 workers (about 19% of the total labour force of 16,000) would be insufficient to cover the shortfall because of normal labour demand outside of the Southeast Peninsula. These include another 2,000 workers to build and staff facilities planned for the Frigate Bay area, plus several hundred other worker to supply expected growth in government and other non-tourist sectors.

Clearly, the Early Development scenario will overextend the local labour supply, stimulate immigration, and spawn wage and raw material inflation. In addition, this scenario yields a spectacular drop in unemployment from roughly one-fifth of the labour force to zero in five short years -- a remarkably unrealistic and unprecedented outcome for a chronic labour-supplus Caribbean economy. It is far more accurate to assume that because of skill and geographic immobilities, the concentrated pace of activity will cause labour bottlenecks and immigration far short of full employment levels. It is more likely that the rush of activity will redeploy productive labour away from more slowly growing sectors, bypass domestic intermediate and final goods linkages, and directly conflict with Government's goals of balanced diversification, reduced dependence, and expanded housing.

The second scenario ("Manageable Growth," Tables A-22, 23, and 24) assumes that total tourism growth on St. Kitts will be managed to achieve a long-term compound rate of growth of approximately 7.5% per year. This model results in a slower rate of development and assumes that growth in tourism will be balanced between the Frigate Bay Development and the rest of the Southeast Peninsula. At the end of twenty years, the Manageable Growth scenario results in only 400 (15%) fewer hotel rooms. However, there is a much higher probability that employment, management, and resort ownership advantages will accrue to local residents, rather than immigrants and outsiders. The slower rate of growth will enable more Kittitians to move into positions of responsibility within the industry, and new investments in the later years can be financed directly with retained earnings, rather than relying on new imports of outside capital.

The tables representing these two scenarios are presented on the following pages. The Early Development Model presents a spreadsheet (Table A-19) showing possible developments at each major potential tourism facility site in the Southeast Peninsula. It should be em-

phasised that these projections are purely hypothetical. They are presented simply to illustrate one view of how the Southeast Peninsula might eventually be developed, and they have absolutely no relation to any actual developments or firm plans known to the IRF land use management planning team.

Each table elaborates on the investment and earning implications of the tourism development scenario being examined. Of special interest are the estimated direct and indirect taxes which will be generated by each scenario. When these revenues are compared with the costs of the major public infrastructure projects (see below, Tables A-26 and 27), even the modest growth rates of the "manageable growth" scenario are more than adequate to pay for the public sector investments. In other words, the direct and indirect taxes on tourism growth stemming from opening the Southeast Peninsula appear to be sufficient to pay for the capital and maintenance costs of the necessary public infrastructure. This assumes that GSKN will acquire by purchase very little land area on the Southeast Peninsula for public management but will address the issue of conservation protection and recreational needs via negotiated easements and regulatory land use controls.

The second major point of interest is the rapid growth of employment in tourism related services, as revealed in the "Supply-Side Development" table (Table A-22) of the Manageable Growth scenario. In twenty years, while the total labour force will be growing at less than 1.5% per year (i.e., about 264 workers per year, see Section A.3.1 above), jobs in tourism and related sectors are expected to expand at a rate of nearly 8.5%, or 283 jobs per year. By the end of the period, if this scenario is followed, tourism will have replaced agriculture as St. Kitts' dominant industry.

The ability of the labour force to respond to the new demands of the tourism economy should be a major concern for public policy makers. The experience of St. Croix and St. Maarten offer clear examples of cases where a rapidly growing labour demand stimulated immigration, rather than reducing domestic unemployment or helping the local economy to move people out of a declining sector (cane or refinery workers) into tourism. Thus, the results of this analysis clearly reinforce the conclusions reached by the United States AID Mission in 1985: "Nowhere in the Caribbean is the need to reorientate the labour force as great or as immediate."

### A.6.2 Private Investment Models

The Private Investment Models are an attempt to illustrate the kinds of return which might be expected by an "average" investor in a new resort in the Southeast Peninsula. This model is a tool for understanding some of the constraints facing private investors and developers. Although built from a variety of local and regional factors, the model illustrates the low rates of return usually reported for resort developments throughout the Eastern Caribbean, such as the 1985 Horvath and Horvath/American Express report on tourist resorts in Latin America and the Caribbean. In spite of the model's relatively small size, the development of this model received more attention than any other aspect of the economic analysis.

The reason for this attention is that the model is pessimistic about the opportunities for profitable investments in resort properties in the Southeast Peninsula. The four scenarios presented here (Table A-25), representing four different size hotels, show average internal rates of return over twenty years of 1.5% to 4.4%. The inverse relation between hotel size and rate of return is primarily explained by the model's constant room rate and the arguable assumptions that amenities in larger resorts are more expensive, while variable costs remain relatively constant. Although these cost assumptions could be varied, the assumptions employed are consistent with current regional experience, and the basic construction cost (\$EC 190/square foot) is already extremely low.

These low returns do not mean a carefully planned and managed resort cannot realise a substantial profit in St. Kitts; it does mean, however, that private investors must be able to assure that their investment plan is superior to other, more "average" hotel developments in the region. Forms of mixed hotel/condominium ownership would appear to be especially attractive options, since large portions of the resort development costs are borne by individual private investors (who, if U.S. taxpayers, often gain tax advantages).

From the private investor's perspective, the critical factor in achieving a profitable hotel is the ability to charge room rates considerably above the average for tourist hotels in the Eastern Caribbean. Maintaining a high occupancy rate (over 80%) and designing unique management models (labour intensive with low capital and energy costs, such as Ocean Terrace Inn in St. Kitts or Young Island Resort in St. Vincent) are also promising development alternatives. The cautionary note provided by the Private Investment Model is that the total environment of the Southeast Peninsula must be attractive to relatively wealthy tourists. However, in order to insure maintenance of a sustained level of environmental quality, the private sector will have to rely on Government services and assistance because potential returns do not provide confidence that private support can obtain environmental amenities on the Southeast Peninsula for a prolonged period of time.

The Private Investment Model assumes an average land cost for prime resort property of \$50,000 per acre, which is in line with recent land sales on the Southeast Peninsula. One implication of the model is that this level, which would represent a massive windfall to most of the Peninsula's current landowners, may be above the level which a prudent developer would pay, given the other potential problems he would face. In addition, developers would encounter problems getting commercial credit to bankroll a resort development in St. Kitts, given the area's unproven tourist potential.

For public policy makers, the lesson of the Private Investment Model is that investors in the Southeast Peninsula will need to be carefully cultivated and encouraged. Government should exercise some discretion to reward developers who can demonstrate positive prior experience in the Caribbean and who can guarantee design features, recreational amenities and operational efficiencies sufficient to assure that the overall quality of the tourism facilities in the Southeast Peninsula are not degraded. Government should not require or expect that investors will be able to provide substantial additional concessions because large profit margins do not exist.

On the other hand, it is critically important for Government to maintain a high level of basic public services in the Southeast Peninsula, in order to sustain an attractive environment for both the high income tourists who are necessary for the success of the major resorts in the area and for local recreational users who presently have very limited, lower quality options. Several other sections of this report outline the public services required of Government if it is to fulfill its proper role as a "partner" in Southeast Peninsula development strategies. Failure to provide these services from the outset will place the entire venture at risk and ultimately involve costly remedial action. It is a sobering truth that Government's amenity support on the supply side is just as crucial for a successful development scenario as the number and affluence of tourists on the demand side.

#### A.6.3 Public Investment Models

The specific Public Investment Models presented in this analysis (Tables A-26 and 27) represent the costs of amortizing and maintaining the road and water system necessary to support any tourism development in the Southeast Peninsula. Actual cost factors employed for these two scenarios are based on the Roughton analysis of 1980 for the road and recent cost estimates for the water system, provided by the St. Kitts-Nevis Department of Public Works. Using a similar methodology and cost factors developed in Coopers and Lybrand, 1983 (Appendices A-3 and A-4), we also examined costs of extending the telephone and power systems to the Peninsula, and determined that existing rate structures are probably sufficient to pay for the costs of extending these services over a twenty year period. Costs do not include the expense of purchasing land or easements for the road and water system rights-of-way. It also assumes feeder roads to specific development

sites will be constructed by the individual landowners, as and when required and according to design standards set by GSKN.

For both the road and water systems, we present the results of a "long" and a "short" option (equivalent to building only to White House Bay or extending the systems all the way around the Great Salt Pond), and we also compare the costs of "soft" and "very soft" financing terms (soft being 20 years at 6% and very soft being 40 years at 3%).

The basic conclusions of this portion of the analysis are very simple:

1. The costs of major public infrastructure and maintenance requirements, even in worst case conditions, can readily be paid out of expected increases in tourism-based revenues.

[Note that this addresses only the economic and financial possibility. It will undoubtedly require an act of considerable political will to continue to provide a high level of public services to the tourism developments of the Southeast Peninsula over a long period of time.]

2. Based on rough calculations, current water system charges will pay for about 10% of the costs of building a pipeline and pumping system to the Southeast Peninsula. For fiscal recovery and to promote desirable conservation measures, water rates for the Southeast Peninsula and Frigate Bay should be increased.

Table A-19. EARLY DEVELOPMENT SCENARIO: Tourism Supply-Side Development

Assumes early development of three major resorts in the Southeast Peninsula, with 20 year construction averaging roughly 100 hotel rooms or condos per year.

ASSUME:		Building Costs:		Units are:																	Condominium Tax:	
		Hotel/room	79.8 (\$EC 1,000's)	Hotel Rooms																	5%	
		Condo/unit	202.8	Condominium Apartments																	Condominium Turnover:	
		Homes	327.8	Houses																	14%/year	
Development Type	Character Site	YEAR																				
		Now	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
total	Banana Bay	12	12	12	35	35	35	35	50	50	50	50	50	100	100	100	125	125	125	125	125	125
total	Cockleshell	10	10	10	35	35	35	35	35	35	35	35	35	100	100	100	100	100	125	125	125	125
total	Friar's Bay				200	200	200	200	200	200	200	200	250	250	250	300	300	300	325	350	350	350
Condo	Friar's Bay					10	20	20	30	40	40	50	50	50	60	60	60	60	60	70	70	70
2nd Home	Friar's Bay	2	2	3	3	3	5	7	9	12	14	16	22	26	31	35	40	43	49	55	58	63
total	Canoe Bay							50	50	50	50	50	75	75	75	100	100	100	100	100	150	150
Condo	Canoe Bay						10	30	30	30	30	40	40	50	50	55	55	60	65	65	75	75
total	Sand Bank Bay						250	250	250	250	250	250	250	250	250	250	250	250	275	275	275	300
Condo	Sand Bank Bay							10	10	20	30	30	40	50	60	60	70	80	80	90	90	100
total	Fleming Est.							50	50	50	50	50	50	100	100	100	175	175	175	175	175	300
Condo	Fleming Est.								10	10	25	25	40	40	50	60	70	80	90	110	120	120
2nd Home	Fleming Est.							5	15	18	22	28	30	33	35	38	44	49	56	65	69	74
total	Major Bay					200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	250
total	White House							25	25	25	25	25	25	50	50	50	50	50	50	50	50	75
Marina	White House							150	150	150	150	150	150	150	150	150	150	150	150	150	150	150
Totals:	Hotel Rooms	22	22	22	270	470	745	795	860	860	875	925	950	1075	1175	1175	1225	1325	1400	1400	1500	1675
	Condo Units	0	0	0	0	10	30	60	80	100	125	145	170	190	220	230	255	275	290	335	345	365
	Second Homes	2	2	3	3	8	20	25	31	40	44	51	57	64	75	84	96	103	114	124	132	142
Annual	Construction:																					
	Hotel Rooms	0	0	248	200	275	50	65	0	15	50	25	125	100	0	50	100	75	0	100	175	
	Condo Units	0	0	0	10	20	30	20	20	25	20	25	20	30	10	25	20	15	45	10	20	
	Second Homes	0	1	0	5	12	5	6	9	4	7	6	7	11	9	12	7	11	10	8	10	
Annual	Construction Costs in \$EC 1,000,000's (exclusive of land costs):																					
	Hotel Rooms	0.0	0.0	19.8	16.0	21.9	4.0	5.2	0.0	1.2	4.0	2.0	10.0	8.0	0.0	4.0	8.0	6.0	0.0	8.0	14.0	131.9
	Condo Units	0.0	0.0	0.0	2.0	4.1	6.1	4.1	4.1	5.1	4.1	5.1	4.1	6.1	2.0	5.1	4.1	3.0	9.1	2.0	4.1	74.0
	Second Homes	0.0	0.3	0.0	1.6	3.9	1.6	2.0	2.9	1.3	2.3	2.0	2.3	3.6	2.9	3.9	2.3	3.6	3.3	2.6	3.3	45.9
Total SEP	Annual Invest	0.0	0.3	19.8	19.6	29.9	11.7	11.2	7.0	7.6	10.3	9.0	16.3	17.7	5.0	13.0	14.3	12.6	12.4	12.6	21.3	251.8
INDIRECT TAX REVENUES at	3% of Tourism Construction:																					
(\$EC \$ MM's)		0.0	0.0	0.6	0.6	0.9	0.4	0.3	0.2	0.2	0.3	0.3	0.5	0.5	0.1	0.4	0.4	0.4	0.4	0.4	0.6	7.6
INDIRECT TAXES FROM CONDOMINIUM TURNOVER:																						
(\$EC \$ MM's)		0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.5	4.7



Table A-21. EARLY DEVELOPMENT SCENARIO: Total St. Kitts Tourism Growth

Impacts of tourism growth in Southeast Peninsula, combined with growth of Frigate Bay and other St. Kitts resorts.

Assume: Occupancy	Person/unit	Stay (days)	Expenditures/person/day								Hotel Tax	Depart Tax	Building Costs									
			In-Hotel				Outside															
Hotel	60%	1.7	(EC\$)				(EC\$)				7%	EC\$13.50	EC\$ 79.8 (000's)									
Condo	40%	2.0	268				110				7%	13.50	202.8									
2nd Home	30%	3.0	225				125				0%	13.50	327.8									
St. Kitts	30%	1.5	200				75				7%	13.50	51.0									
YEAR																						
	Nov	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Southeast Peninsula Accomodations:																						
Totals:	Hotel Rooms	22	22	270	470	745	795	860	860	875	925	950	1075	1175	1175	1225	1325	1400	1400	1500	1675	
	Condo Units	0	0	0	10	30	60	80	100	125	145	170	190	220	230	255	275	290	335	345	365	
	Second Homes	2	2	3	8	20	25	31	40	44	51	57	64	75	84	96	103	114	124	132	142	
Frigate Bay Accomodations:																						
Totals:	Hotel Rooms	414	460	505	565	620	685	735	790	830	885	940	950	965	970	980	985	995	1010	1025	1038	1050
	Condo Units	54	72	88	105	120	135	155	172	189	202	220	220	230	230	235	235	240	245	245	250	
	Second Homes	14	18	22	25	28	31	34	37	40	44	48	51	55	59	63	67	70	74	78	81	85
Other St. Kitts Accomodations:																						
Totals:	Hotel Rooms	160	165	170	175	180	185	190	195	200	205	210	220	230	240	250	260	270	280	290	300	310
	Condo Units	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Second Homes	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Visitors: (in 1,000s)																						
Totals:	Hotel Rooms	34.8	38.0	41.3	62.3	79.7	102.9	109.8	118.1	121.0	125.9	133.1	135.8	145.6	153.1	154.1	158.1	165.9	172.3	173.7	181.7	194.6
	Condo Units	2.3	3.0	3.7	4.4	5.4	6.9	9.0	10.5	12.1	13.6	15.2	16.3	17.5	18.8	19.2	20.4	21.3	22.1	24.2	24.6	25.7
	Second Homes	0.5	0.7	0.8	0.9	1.2	1.7	1.9	2.2	2.6	2.9	3.3	3.5	3.9	4.4	4.8	5.4	5.7	6.2	6.6	7.0	7.5
	ALL St. KITTS	37.5	41.7	45.7	67.6	86.3	111.4	120.7	130.8	135.7	142.4	151.6	155.7	167.1	176.3	178.1	183.9	192.9	200.6	204.5	213.3	227.8
Visitor Expenditures: (in \$EC 1,000,000s)																						
Totals:	in Hotels	48.8	53.5	58.2	89.1	114.7	148.8	156.9	171.0	175.2	182.3	193.0	196.8	211.1	221.9	223.2	229.0	240.4	249.7	251.5	263.1	282.1
	in Condos	3.5	4.7	5.8	6.9	8.5	10.8	14.1	16.6	19.0	21.5	24.0	25.6	27.6	29.6	30.2	32.2	33.5	34.8	38.1	38.8	40.4
	Outside H/Cs	25.8	29.0	32.1	45.7	57.9	74.7	81.8	89.3	93.8	99.2	106.3	110.0	118.2	125.5	127.8	133.1	139.6	145.8	150.2	156.5	166.7
	ALL St. KITTS	78.1	87.2	96.1	141.6	181.1	234.3	254.8	276.9	288.0	303.0	323.3	332.4	356.9	376.9	381.2	394.3	413.5	430.2	439.8	458.3	489.1
Annual Private Investment Requirement: (in \$EC 1,000,000s) -- buildings only, exclusive of land values:																						
Totals:	Hotels	3.9	3.8	24.8	20.6	27.4	8.2	9.8	3.4	5.8	8.6	3.3	11.7	8.9	1.3	4.9	9.3	7.7	1.7	9.5	15.4	
	Condos	3.6	3.2	3.4	5.1	7.1	10.1	7.5	7.5	7.7	7.7	5.1	6.1	6.1	2.0	6.1	4.1	4.1	10.1	2.0	5.1	
	2nd Homes	1.3	1.6	1.0	2.6	4.9	2.6	2.9	3.9	2.6	3.6	2.9	3.6	4.9	4.3	5.2	3.3	4.9	4.6	3.6	4.6	
	ALL St. KITTS	8.9	8.7	29.3	28.3	39.4	21.0	20.3	14.9	16.2	19.9	11.3	21.4	19.9	7.6	16.2	16.6	16.7	16.4	15.2	25.1	
Cumulative Total Private Tourism Investment: (in \$EC 1,000,000s)																						
Totals:	Hotels	43.0	46.9	50.7	75.6	96.2	123.5	131.8	141.6	145.1	150.9	159.5	162.8	174.5	183.4	184.7	189.6	198.9	206.6	208.3	217.8	233.3
	Condos	10.9	14.6	17.8	21.3	26.4	33.5	43.6	51.1	58.6	66.3	74.0	79.1	85.2	91.2	93.3	99.4	103.4	107.5	117.6	119.6	124.7
	2nd Homes	5.2	6.6	8.2	9.2	11.8	16.7	19.3	22.3	26.2	28.8	32.4	35.4	39.0	43.9	48.2	53.4	56.7	61.6	66.2	69.8	74.4
	ALL St. KITTS	59.1	68.0	76.8	106.0	134.3	173.7	194.7	215.0	229.9	246.1	266.0	277.3	298.7	318.6	326.2	342.4	359.0	375.7	392.1	407.3	432.4
Growth Rates: (compound annual increases)																						
	Tourists:			Tourist Spending:			Total Private Tourist Investment:															
	First Five Years	23.8%		24.0%			24.1%															
	First Ten Years	14.8%		15.1%			16.2%															
	Twenty Years	9.4%		9.5%			10.5%															

Table A-22. MANAGEABLE GROWTH SCENARIO: Tourism Supply-Side Development

Assumes overall growth of tourism in St. Kitts is limited to about 7.5% per year, with emphasis in the first five years on filling out the Frigate Bay development and then moving into the Southeast Peninsula. Includes labour demand for Frigate Bay and the SEP.

Development Character Type	Site	Dev	YEAR																								
			Now	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20				
Tourism Development -- Southeast Peninsula Only																											
Hotel Rooms		22	24	25	27	29	62	76	96	119	142	158	193	259	366	481	568	677	818	866	1030	1157					
Condo Units																		13	33	55	98	137					
Second Homes		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	4	7	11	17	23					
Development of Southeast Peninsula and Frigate Bay Combined:																											
Hotel Rooms		436	459	504	542	582	656	715	783	857	936	1011	1110	1209	1316	1431	1543	1677	1818	1966	2130	2307					
Condo Units		54	58	62	67	72	78	83	90	96	104	111	120	129	138	149	160	185	218	253	298	342					
Second Homes		16	17	24	27	30	33	36	39	42	46	50	53	57	61	65	69	74	81	89	98	108					
Annual Construction for Southeast Peninsula Only:																											
Hotel Rooms		2	2	2	2	33	14	20	23	23	16	35	66	107	115	87	109	141	48	164	127						
Condo Units		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	20	22	43	39						
Second Homes		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	4	6	6						
Annual Construction for Southeast Peninsula and Frigate Bay:																											
Hotel Rooms		33	35	38	41	74	59	68	75	78	76	99	99	107	115	112	134	141	148	164	177						
Condo Units		4	4	5	5	5	6	6	7	7	8	8	9	10	10	11	25	33	36	45	44						
Second Homes		1	7	3	3	3	3	3	3	4	4	3	4	4	4	4	5	7	8	9	10						
Construction Costs for SE Peninsula and Frigate Bay (in \$EC 1,000,000's):																											
Hotel Rooms		2.6	2.8	3.0	3.2	5.9	4.7	5.4	5.9	6.3	6.0	7.9	7.9	8.5	9.2	8.9	10.7	11.3	11.8	13.1	14.1	146.7					
Condo Units		0.8	0.9	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	2.0	2.1	2.3	5.1	6.7	7.3	9.0	8.9	57.58					
Second Homes		0.3	2.3	1.0	1.0	1.0	1.0	1.0	1.0	1.3	1.3	1.0	1.3	1.3	1.3	1.3	1.6	2.3	2.6	2.9	3.3	29.81					
TOTAL Annual Invest		3.8	6.0	4.9	5.2	8.0	6.8	7.7	8.3	9.0	8.9	10.6	11.0	11.8	12.6	12.5	17.4	20.2	21.7	25.1	26.3	234.1					
Labor Demand Factors:																											
Construction (many years):		Staffing:		Indirect employment:																							
		Skilled Unskilled		Skilled Unskilled		Skilled Unskilled																					
Hotel Rooms		0.8	1.0	0.0	1.0	0.0	1.4																				
Condo Units		2.3	2.8	0.0	1.0	0.0	1.4																				
Second Homes		4.4	5.2	0.0	1.0	0.0	0.7																				
Wage & Fringe \$		15.0	6.3 (EC\$ 1,000's/year)	15.0	6.3	12.0	5.5																				
Total Estimated Labor Demand for Tourism in SE Peninsula and Frigate Bay:																											
Hotel Rooms		1112	1196	1265	1382	1539	1691	1849	2025	2212	2397	2621	2860	3113	3386	3659	3969	4305	4659	5045	5465	5583					
Condo Units		152	163	175	188	202	218	234	251	270	291	312	336	361	388	417	516	617	712	843	948	828					
Second Homes		38	96	70	75	80	86	91	96	111	118	115	130	136	143	150	167	195	216	240	265	186					
TOTAL		1302	1455	1531	1645	1822	1994	2174	2372	2593	2805	3048	3325	3611	3918	4227	4651	5117	5587	6128	6677	6596					
Indirect Tax Revenues from Construction at 3% -- in EC\$1,000,000's:																											
All Units		0.1	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.6	0.7	0.8	0.8						





(revised)

Tables A-25. PRIVATE INVESTMENT MODEL.

Analysis of costs and returns for hotels from 50 to 400 rooms.  
(Dollar amounts in EC\$1,000's.)

Assumptions:																						
Case:	Rooms	Sq ft.	Cost /ft	Amenity Fctr	Land Costs Acres EC(\$)		Finance Costs	Operating Costs (% of Total Sales) Payroll Food Other			Occupancy Rates % Room \$/Room		Tourist Hotel Spending/Day Total= Room+ Food+ Misc.									
I	50	300	190	1.10	8.0	135.0	9.5%	23%	20%	42%	60%	1.7	EC\$	270	172	84	14					
II	125	300	190	1.15	20.0	125.0	9.5%	23%	20%	43%	60%	1.7		270	172	84	14					
III	250	300	190	1.20	40.0	120.0	9.5%	23%	20%	44%	60%	1.7		270	172	84	14					
IV	400	300	190	1.25	64.0	100.0	9.5%	23%	20%	45%	60%	1.7		270	172	84	14					
Cash Flow Factors:																						
	Total Costs:	Yearly Amortization		Annual Total Sales			Operating Costs Payroll Food Other			Gross Income	PreTax Profit											
I	4215	478		5026	1156	1005	2111	754	276													
II	10694	1213		12565	2890	2513	5403	1759	546													
III	21900	2483		25130	5780	5026	11057	3267	784													
IV	34877	3955		40206	9248	8042	18094	4825	870													
Global Cash Flow																						
	YEAR	Zero	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
I		-4215	-729	150	150	276	276	276	276	276	276	276	276	276	276	276	276	276	276	276	276	4543
II		-10694	-1967	988	988	546	546	546	546	546	546	546	546	546	546	546	546	546	546	546	546	10893
III		-21900	-4243	2244	2244	784	784	784	784	784	784	784	784	784	784	784	784	784	784	784	784	21334
IV		-34877	-7172	3543	3543	870	870	870	870	870	870	870	870	870	870	870	870	870	870	870	870	31109
INTERNAL RATE OF RETURN:																						
I		4.4%																				
II		3.9%																				
III		2.7%																				
IV		1.5%																				

These conservative assumptions reflect returns of approximately 4%, after inflation, based on the expectation that: (1) land values will double in 20 years; and (2) the value of the resort is one-half its original construction cost (in real terms) after 20 years.

Note: Columns 2-7 represent construction and land acquisition costs for various sized hotels. For example, costs for a 50-room facility averaging 300 square feet/room are estimated at EC\$190/sq. ft. for construction plus a multiplier factor of 1.10 for common areas and infrastructure plus 8 acres of land at EC\$135,000/acre.

Table A-26. PUBLIC INFRASTRUCTURE MODEL: Southeast Peninsula Road.  
(Dollar amounts in EC\$1,000's.)

Assumptions:		Length km.	Financial Conditions				Annual Maintenance Factors					Periodic Repairs		Repair & Constr. Phase	
Case:	Cost		Length Term	Grace	Interest Rate Main	Grace	Manpower Skill	Unskl	Labor Rates Skill	Unskl	Labor Intense	Amount	Freq (yrs)	Manpower Costs Skilled	Unskilled
I	13000	6	20	5	6.0%	3.5%	3	7	12.5	5.0	50%	1300	6	9.2%	11.8%
II	13000	6	40	10	3.0%	2.0%	3	7	12.5	5.0	50%	1300	6	9.2%	11.8%
III	15000	10	20	5	6.0%	3.5%	3	10	12.5	5.0	50%	1500	6	9.2%	11.8%
IV	15000	10	40	10	3.0%	2.0%	3	10	12.5	5.0	50%	1500	6	9.2%	11.8%

	Yearly Finance Costs		Annual
	Grace Period	Main Term	Maint.
I	914.7	1084.7	145
II	475.2	606.1	145
III	1055.4	1251.6	175
IV	548.3	626.6	175

Annual Costs		YEAR																					
			Zero	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Average:	1335	I	457	987	1060	1060	1060	1060	2530	1230	1230	1230	1230	1230	2530	1230	1230	1230	1230	1230	2530	1230	1230
	824	II	238	548	620	620	620	620	1445	620	620	620	620	751	2051	751	751	751	751	751	2051	751	751
	1547	III	528	1143	1230	1230	1230	1230	2927	1427	1427	1427	1427	1427	2927	1427	1427	1427	1427	1427	2927	1427	1427
	923	IV	274	636	723	723	723	723	1675	723	723	723	723	802	2302	802	802	802	802	802	2302	802	802

Annual Manpower Needs	YEAR																					
		Zero	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
I. Skilled	96	2	3	3	3	3	3	13	3	3	3	3	3	13	3	3	3	3	3	13	3	3
Unskilled	308	4	7	7	7	7	7	34	7	7	7	7	7	34	7	7	7	7	7	34	7	7
TOTAL	403	5	10	10	10	10	10	46	10	10	10	10	10	46	10	10	10	10	10	46	10	10
II. Skilled	96	2	3	3	3	3	3	13	3	3	3	3	3	13	3	3	3	3	3	13	3	3
Unskilled	308	4	7	7	7	7	7	34	7	7	7	7	7	34	7	7	7	7	7	34	7	7
TOTAL	403	5	10	10	10	10	10	46	10	10	10	10	10	46	10	10	10	10	10	46	10	10
III. Skilled	111	2	3	3	3	3	3	14	3	3	3	3	3	14	3	3	3	3	3	14	3	3
Unskilled	355	5	10	10	10	10	10	38	10	10	10	10	10	38	10	10	10	10	10	38	10	10
TOTAL	466	7	13	13	13	13	13	53	13	13	13	13	13	53	13	13	13	13	13	53	13	13
IV. Skilled	111	2	3	3	3	3	3	14	3	3	3	3	3	14	3	3	3	3	3	14	3	3
Unskilled	355	5	10	10	10	10	10	38	10	10	10	10	10	38	10	10	10	10	10	38	10	10
TOTAL	466	7	13	13	13	13	13	53	13	13	13	13	13	53	13	13	13	13	13	53	13	13

I. A \$13 million (EC) road to White House Bay, financed at 3.5% for a five year grace period, and 6% for the remaining 15 years.

II. A \$13 million (EC) road to White House Bay, financed at 2% for a ten year grace period, and 3% for the remaining 30 years.

NOTE this implies concessionary financing for a FORTY year term.

III. A \$15 million (EC) road with Salt Pond Loop, financed at 3.5% for a five year grace period, and 6% for the remaining 15 years.

IV. A \$15 million (EC) road with Salt Pond Loop, financed at 2% for a ten year grace period, and 3% for the remaining 30 years.

NOTE this implies concessionary financing for a FORTY year term.

Table A-27. PUBLIC INFRASTRUCTURE MODEL: Southeast Peninsula Water Distribution System.  
(Dollar amounts in EC\$1,000's.)

Assumptions:		Financial Conditions						Annual Maintenance Factors					Periodic Repairs		Repair & Constr. Phase							
Case:	Cost	Length km.	Length Term	Grace	Interest Rate Main	Interest Rate Grace	Manpower Skill	Unskl	Labor Rates Skill	Unskl	Labor Intense	Amount	Repairs Freq (yrs)	Manpower Skilled	Costs Unskilled							
I	5446	8	20	5	6.0%	3.5%	1	3	12.5	5.0	50%	545	6	9.2%	11.8%							
II	5446	8	40	10	3.0%	2.0%	1	3	12.5	5.0	50%	545	6	9.2%	11.8%							
III	9788	13	20	5	6.0%	3.5%	1	5	12.5	5.0	50%	979	6	9.2%	11.8%							
IV	9788	13	40	10	3.0%	2.0%	1	5	12.5	5.0	50%	979	6	9.2%	11.8%							
		Yearly Finance Costs		Annual Maint.																		
		Grace Period	Main Term																			
I		383.2	454.4	55																		
II		199.1	227.5	55																		
III		688.7	816.7	75																		
IV		357.8	408.8	75																		
Annual Costs		YEAR																				
		Zero	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Average:	554	I	192	411	438	438	438	1054	509	509	509	509	509	1054	509	509	509	509	509	1054	509	509
	327	II	100	227	254	254	254	600	254	254	254	254	283	827	283	283	283	283	283	827	283	283
	973	III	344	726	764	764	764	1871	892	892	892	892	892	1871	892	892	892	892	892	1871	892	892
	566	IV	179	395	433	433	433	1054	433	433	433	433	484	1463	484	484	484	484	484	1463	484	484
Annual Manpower Needs		YEAR																				
		Zero	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
I.	Skilled	40	1	1	1	1	1	5	1	1	1	1	1	5	1	1	1	1	1	5	1	1
	Unskilled	129	2	3	3	3	3	14	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	TOTAL	169	2	4	4	4	4	19	4	4	4	4	4	8	4	4	4	4	4	8	4	4
II.	Skilled	40	1	1	1	1	1	5	1	1	1	1	1	5	1	1	1	1	1	5	1	1
	Unskilled	129	2	3	3	3	3	14	3	3	3	3	3	14	3	3	3	3	3	14	3	3
	TOTAL	169	2	4	4	4	4	19	4	4	4	4	4	19	4	4	4	4	4	19	4	4
III.	Skilled	72	1	1	1	1	1	8	1	1	1	1	1	8	1	1	1	1	1	8	1	1
	Unskilled	232	3	5	5	5	5	24	5	5	5	5	5	24	5	5	5	5	5	24	5	5
	TOTAL	304	3	6	6	6	6	32	6	6	6	6	6	32	6	6	6	6	6	32	6	6
IV.	Skilled	72	1	1	1	1	1	8	1	1	1	1	1	8	1	1	1	1	1	8	1	1
	Unskilled	232	3	5	5	5	5	24	5	5	5	5	5	24	5	5	5	5	5	24	5	5
	TOTAL	304	3	6	6	6	6	32	6	6	6	6	6	32	6	6	6	6	6	32	6	6
I.	An 8 kilometer pipeline with one booster station and one million gallon tank, financed at 3.5% for a five year grace period, and 6% for the remaining 15 years.																					
II.	A water system as described above, but financed at 2% for a ten year grace period, and 3% for the remaining 30 years. NOTE this implies concessionary financing for a FORTY year term.																					
III.	A 13 kilometer pipeline with one booster station and two million gallon tanks, financed at 3.5% for a five year grace period, and 6% for the remaining 15 years.																					
IV.	A water system as described above, but financed at 2% for a ten year grace period, and 3% for the remaining 30 years. NOTE this implies concessionary financing for a FORTY year term.																					

## APPENDIX B

### REGULATORY AND MANAGEMENT CONSIDERATIONS: THE INSTITUTIONAL FRAMEWORK

#### B.1 INTRODUCTION

#### B.2 PUBLIC/PRIVATE SECTOR RELATIONSHIP

##### B.2.1 Overview

##### B.2.2 The Frigate Bay Development Corporation: A Management Model

##### B.2.2 Alternative Model for Development Control

#### B.3 QUALITY CONTROL AND ENVIRONMENTAL PROTECTION

##### B.3.1 Implementation of the Land Use Management Plan: Management Considerations

##### B.3.2 Management System Alternatives

##### B.3.3 The Environmental Management Unit

##### B.3.4 Inter-Departmental Coordination

##### B.3.5 Training Requirements

## APPENDIX B

### REGULATORY AND MANAGEMENT CONSIDERATIONS: THE INSTITUTIONAL FRAMEWORK

#### B.1 INTRODUCTION

Planning, managing and monitoring the Southeast Peninsula road construction and the tourism facilities and amenities development which follow constitute a formidable set of new responsibilities and tasks for the Government of St. Kitts and Nevis. The Frigate Bay experience pales by comparison and should not be allowed to induce a false sense of confidence about or an underestimation of either the dimensions or the complexity of the new SEP venture.

Not only is the Peninsula four times larger in area, it involves much steeper erosion-prone, rocky hillsides and eleven less stable sandy beaches; includes approximately a dozen major landholders with strong development preferences of their own; and has the lowest rainfall, the highest dunes, the largest salt pond and the greatest potential as an undeveloped area in the State. Furthermore, time is of the essence as the simultaneous social and economic pressures of declining sugar prices, under-employment, and foreign exchange deficits have all been felt at the national level.

The Government of St. Kitts and Nevis therefore confronts the difficult task of rapidly developing new or expanded planning, management, marketing, and monitoring skills and services. Even a preliminary listing of these new or expanded functions will include:

- tourism facilities permitting procedures
- establishment of standards and guidelines (buildings, sewage, roads, marinas, coastal water quality, erosion control)
- design and implementation of an EIA process
- compliance monitoring
- environmental monitoring
- protected and public areas management
- land acquisition and easements
- tax, licencing and user fee policies
- coordination of all of the above
- vision and leadership.

This last item is the most important of all. The Southeast Peninsula development venture is not simply another "project" which can be administered or handled if a half-dozen otherwise technically skilled civil servants try to squeeze a few hours a day out of an already busy schedule to deal with the tasks required. It is rather a cluster of many diverse, interrelated projects wherein the whole can and must be

seen as greater than the sum of its parts. The St. Kitts and Nevis Government has proven that it has the vision to perceive a major role for the Peninsula in the future of the State. It now needs to assert the administrative leadership necessary to realise that vision in an efficient, coordinated, and methodical fashion -- one designed to convert day-to-day decisions, technical input, new and old practices, and the promise of the Peninsula into a rational mosaic of growth.

The discussion which follows outlines an institutional structure or framework needed to shape and encourage the efficient flow of information between project principals, partners and the people (as represented by Government). It focuses on new mechanisms needed to assist Government leaders and their deputies in making well-informed decisions and in reducing the risk of negative or unanticipated economic, social, and environmental impacts deriving from those decisions.

## B.2 PUBLIC/PRIVATE SECTOR RELATIONSHIP

### B.2.1 Overview

The respective roles of the public and private sector in promoting national development objectives are not always clear. In the specific case of the Southeast Peninsula project, these roles are further confused by virtue of landownership being held entirely by the private sector, while the means to secure funds for basic infrastructure to open the area for development rests with the Government. An already ambiguous situation is further complicated by the mutual suspicion with which each sector views the other. These attitudes have been reinforced in recent years by nationalization of the sugar industry and have limited easy implementation of public/private sector "partnerships" or "collective action" strategies. (A notable exception has been the excellent, 20-year working relationship between Government and the private sector in the restoration and development of the Brimstone Hill historic site.)

The situation in St. Kitts and Nevis is not unlike that in other Eastern Caribbean islands. As Khan (1982) has pointed out, since the 1970's there has been a gradual increase of government intervention in economic areas traditionally dominated by the private sector (e.g., agriculture, hotel operation, marketing, export promotion). However, efforts to involve or encourage private sector participation in a systematic way in national development planning continue to be inadequate. Governments, with some consistency, do not fully appreciate the value of a partnership or participatory approach to development, i.e., in enlisting community support, reducing information acquisition costs, and maximizing use of scarce resources in small islands by giving larger numbers a stake in a given project. Similarly, most attempts to discourage private sector initiatives inconsistent with overall national development objectives (by regulation, control, or restrictions) have not been very successful.

Despite these constraints but recognizing that both public and private sector interests are reflected in the land use alternatives proposed for the Southeast Peninsula, USAID has called for the establishment of a "development council" to be comprised of public and private sector representatives. Its establishment is a requirement to finalization of negotiations with GSKN for SEP road financing (Memorandum of Understanding between USA and GSKN, 1985). Interdependency, however, does not necessarily enhance cooperation (indeed, it may intensify conflicts). Therefore, regardless of how the required "development council" is ultimately structured, it is essential that from the outset all parties understand and communicate openly with the other, particularly regarding how each perceives the potential rewards or results (as well as the risks and uncertainties) associated with cooperative action.

In short, Peninsula development rests on the interdependency of public/private sector interests, with the role of each now somewhat loosely outlined (e.g., Government: infrastructure and public services, environmental protection and regulation; private sector: investment, promotion, marketing). The terms of this "collective action bargain," however, are ill-defined, with the present Land Use Management Plan to serve as one means for arriving at a mutually acceptable agreement on a development strategy for the Peninsula.

#### B.2.2 The Frigate Bay Development Corporation: A Management Model

Generally speaking, the fusion of entrepreneurial/private sector initiatives with public sector control mechanisms, in the form of "public enterprises" or quasi-governmental development agencies, has not worked well in the Eastern Caribbean (Kahn, 1982). As instruments of development change, public enterprises per se tread a fine line between the more flexible, experimental, risk-taking biases of the private sector and the accountability/control requirements of the public sector.

In the area of Caribbean tourism development, as noted by Bloomestein (1985), leadership has largely been provided by the private sector acting in response to market demand and essentially in the absence of all but very generalized policy directives or planning guidelines from governments. An exception to the public sector's more secondary role has taken place in St. Kitts with Government's creation of the Frigate Bay Development Corporation (FBDC) in the early 1970's, a statutory body with authority to develop a major tourism complex on land owned by Government at the base of the Southeast Peninsula. Of the persons interviewed by the LUMP team (March 1986), a few, mostly government officials, considered the FBDC a suitable model for SEP development (either by extension of its current authority or creation of a second, but similar agency). A brief look, therefore, at the Corporation's structure, development authority, and regulatory mechanisms is appropriate to the current study. (See also Towle, et al., 1985.)

By statute, the FBDC is under the direction of a Board comprised of a Chairman, Vice Chairman and not more than seven other members, all to be appointed by the Minister of Tourism, who, since the Corporation's inception, has also served as Chairman. In effect, the FBDC Chairman is responsible to himself as Minister, a situation which substantially limits the role of the private sector in FBDC affairs. The enabling legislation also provides for designation of an advisory committee, presently consisting of technical persons employed by Government who have no regulatory authority as a body and can be dismissed at any time.

Building application guidelines have been established for all commercial or residential construction within the Corporation's jurisdiction. The regulations ensure that development proceeds in accordance with the overall master plan and that all buildings meet minimum standards. Generally speaking, based on selected interviews, the FBDC building guidelines are perceived to be reasonable, enforceable, and transferable -- as a model -- to a yet-to-be-designated Southeast Peninsula regulatory and management unit.

With respect to the natural environment, it was the conclusion of a recent study (Towle, et al., 1985) that the FBDC has not managed these resources as effectively as it should. While controls and guidelines exist for management of the built or man-made environment, the natural resources of Frigate Bay are more or less taken for granted, despite the fact that environmental problems have been identified and require attention if the ambience and overall competitive quality of the area are to be sustained.

The main income generating activity of the Corporation is the sale of commercial and residential land, representing approximately 80% of gross income. Gross land sales fell by 50% in 1984, and no commercial sales were recorded in 1984. Approximately 60% of available land has now been sold (Towle, et al., 1985). Marketing efforts are largely managed through the promotional campaigns of the St. Kitts and Nevis Government.

It is in this latter area -- development and promotion -- that those who oppose expansion of the "FBDC model" to the Peninsula are most vocal. The perception in the private sector is that Government has, more or less, approached Frigate Bay as if it was a location (not a development project) and they were real estate agents (rather than agents of development change). To many in the private sector, FBDC has become a "maintenance" organisation in need of more aggressive marketing strategies. The recent decline in FBDC sales is of concern to SEP landowners, who also reject any formalized or structured "development control" role for Government in the Southeast Peninsula (SEP landowners meeting with LUMP team, 21/03/86).

The FBDC experience points to an internal conflict characteristic of public development enterprises. The task of reconciling the open-

ended/autonomous structure of private sector development with the centralised/controlling practices of governments must be resolved in order to achieve sustained economic growth. Even where public managers have access to funds, expertise or personnel to promote development, the relative absence in government agencies of the aggressive entrepreneurial skills associated with economic expansion persists as an underlying systemic constraint.

Furthermore, while the FBDC "model" does have value as an example of orderly growth and development, it cannot be extrapolated in toto to the Peninsula since land there is held in private ownership while Frigate Bay land was purchased by Government in the late 1950's. It should also be noted that if development activity is to be accelerated at Frigate Bay in the next twenty years (see "development models" provided in Appendix A), if facilities there are to be upgraded or expanded, and if environmental management concerns are to be adequately addressed, the Corporation will have a full agenda during the very years when development initiatives for the Peninsula will be most aggressively pursued.

Therefore, given the fact that a great many of the economic decisions for the Southeast Peninsula's development will be made by the private sector outside the control of Government, it is not recommended that the GSKN seek to incorporate within the SEP planning framework an expansion or replication of the Frigate Bay Development Corporation model. Rather, it is our conclusion that Government can best assist Peninsula development by:

- building the road
- streamlining incentives for guiding private sector investment
- promoting the Peninsula as an asset with development potential for the country
- mobilizing public support for the national goals associated with the Peninsula's development
- providing a framework for Peninsula development which minimizes adverse impacts
- managing the Peninsula's environment to ensure sustainable use for generations to come.

### B.2.3 Alternative Model for Development Control

The adoption of a Land Use Management Plan for the Southeast Peninsula is a prerequisite to USAID funding for road construction (Memorandum of Understanding between USA and GSKN, 1985). While both the private and public sector are supportive of overall objectives for development of the Peninsula, neither sector has, as yet, set forth a comprehensive conceptual framework for SEP development. Throughout the interview phase of the current project, both groups displayed little evidence that adequate consideration had been given to, for example, the "style" of tourism planned for the Peninsula. This is not entirely

unexpected, however, since GSKN is awaiting presentation of the current Land Use Management Plan before moving ahead with substantive policy considerations; while SEP landownership is fragmented among scattered individuals and corporations with varying degrees of interest in investment/development options for their individual parcels.

At a meeting held with landowners and a Government representative (March 1986), landowners asserted that a favourable investment climate exists for Peninsula development (contingent, of course, on building the road). There was, however, no indication that landowners had reached any kind of informal consensus concerning such issues as pace of development, style of tourism, optimum scale, reducing environmental impacts, or marketing targets. This is perhaps not unreasonable at this early stage of development planning, but it does point to the usefulness of the Land Use Management Plan as a focusing device to, in effect, force discussion of critical policy, investment and promotion concerns.

Government, too, lacks a consensus regarding the kind of tourism development sought for St. Kitts, e.g., "compound tourism," as represented by the Jack Tarr Village experience at Frigate Bay, is not universally regarded as the "appropriate" direction for the island. Nevertheless, Government and the landowners are in agreement that whatever the scale of tourism development identified for the Peninsula, it must not be out of phase with the capacity of the country to absorb the potential impacts. As stated by one SEP landowner, "We must have development built to fit the place" (landowners meeting with IRF team, 21/03/86). How this is to happen in the absence of a consensus remains an unresolved, but critical question -- particularly since, as stated in a recent issue of "Caribbean Tourism" (CTRC, 1986), the importance of cooperation in tourism between the public and private sectors can be demonstrated at a national level elsewhere in the Caribbean.

In order to provide an organisational framework for consideration of land use options and for reaching consensus on a formal Land Use Management Plan, it is recommended that a Southeast Peninsula Development Board be created by enactment of appropriate enabling legislation. The Board should be established, with operating rules and regulations, to accomplish the following functional objectives:

- To provide a forum for public/private sector discussion on land use and development options for the Southeast Peninsula;
- To make recommendations to Government regarding adoption of an official Land Use Management Plan for the Southeast Peninsula based on the guidelines suggested in this report and in the antecedent Environmental Assessment Report;

- To stimulate interest in the Peninsula as a new tourist destination by promoting both the larger interests of the State and the particular interests of the land-owners and developers;
- To review development applications for the Peninsula and to issue an endorse/reject sign-off on each.

The initial task of the Board will be to prepare and submit recommendations to Government on a development strategy for the Peninsula, using as a benchmark for its deliberations the guidelines suggested in both this report and in the earlier Environmental Assessment Report. The objective is to reach agreement by the public and private sectors on specific details to be incorporated into an official Southeast Peninsula Land Use and Development Plan. That Plan will consist of both land use maps and policy guidelines which should control overall development for the Peninsula.

Following adoption of an official Land Use and Development Plan, the Board will function as the body responsible to the Minister of Development for implementation of objectives set forth in the Plan. The Board will review all development applications for the Peninsula which must meet the criteria for land use defined in the official Southeast Peninsula Land Use and Development Plan. Each project proposal will receive an endorse or reject sign-off by the Board before the application is forwarded to the Minister, who provides final approval.

It is recommended that the Board be comprised of nine members appointed by Cabinet, with the following specific composition:

- 1/3 Government representatives
- 1/3 SEP landowners
- 1/3 private citizens, non-government persons.

Government representatives should be from ministries or departments most directly involved with Peninsula development, e.g., Ministry of Labour and Tourism, Attorney General's Office, Planning Office, Ministry of Finance, Ministry of Communications and Works.

With respect to landowner representation, it is recommended that one of the three appointments be reserved for a "small" landholder, with definition of this designation to be provided in the enabling legislation.

It is recommended that the non-government positions be filled by senior persons with appropriate technical and professional skills, such as an architect or engineer, a representative of the business or banking community, an attorney and, if possible, an individual with an environmental affairs background. Individuals should be selected for their professional skills and/or independent perspective and record of community leadership.

To guard against disproportionate influence being exerted by any individual or group of individuals serving on the Board, it is suggested that the term of office for private sector representatives be limited to two years. Consideration might also be given to periodic rotation of the public sector Board members. The chairperson of the Board should be appointed by Cabinet from among the private sector members of the Board.

Over time, as the level of Peninsula development activity increases, it may be necessary for the SEP Development Board to acquire an independent secretariat, including professional staff. However, during initial stages of Peninsula development, it is recommended that the staff of the Planning Office serve as the Board's secretariat. This assistance will be particularly useful during the initial phases of Board activities when the establishment of procedural requirements, building guidelines, regulatory mechanisms, etc. will be time consuming and warrant professional input by experienced specialists.

In addition to establishment of the Southeast Peninsula Development Board, it is recommended that Peninsula landowners give consideration to formation of a "Landowners Association." Such a body would serve to consolidate and project more coherent private sector development policy positions and would also provide the means for property holders to work together in promoting issues of common concern (e.g., implementation of a reforestation plan, roadside maintenance, overseas marketing, etc.)

### B.3 QUALITY CONTROL AND ENVIRONMENTAL PROTECTION

The World Commission on Environment and Development emphasises in its 1985 Mandate for Change what it terms "the mutually supportive relationship between environment and development," noting that experience has repeatedly demonstrated the short, medium and long term environmental effects of development activities -- whether such impacts have been negative or positive. Further, the Commission writes:

... when it comes to the environment and development ... to anticipate and prevent what may occur in the future is a more secure and more cost-effective approach than the present focus on reaction and cure [for] the 'react and cure' approach can lead to irreversible effects.

With respect to the poorer, developing countries of the world, the report stresses that they -- unlike richer, industrialized nations -- are not in a position to afford after-the-fact, react-and-cure strategies. It is, therefore, even more imperative for developing nations such as St. Kitts and Nevis to look to before-the-fact, anticipate-and-prevent strategies during the planning or design phases of major development activities when the react-and-cure approach can best be avoided.

For the Frigate Bay Development Project, the Government of St. Kitts and Nevis established more rigorous guidelines to regulate development activities under the jurisdiction of the FBDC. However, as noted above (Section B.2.2), this experiment with tighter control procedures extends only to the man-made features of Frigate Bay, with significant degradation of the natural resource base already becoming apparent (Towle, *et al.*, 1985). Clearly, if the Frigate Bay Project is to serve as an example, upgrading the institutional capacity of Government to deal with environmental management is required. Intervention by Government to protect, enhance, and regulate the environment is openly acknowledged by Southeast Peninsula landowners as a responsibility of the public sector (landowners meeting with IRF team, 21/03/86), but this will require more systematic intervention by professionally trained personnel to meet the environmental challenge posed by projected SEP development.

### B.3.1 Implementation of the Land Use Management Plan: Management Considerations

Upon adoption of the Land Use Management Plan for the Southeast Peninsula (which is linked to the Environmental Protection Plan outlined earlier in the SEP Environmental Assessment Report [1986]), the Government of St. Kitts and Nevis will have in hand a considerable body of planning information related to the environment of the Peninsula and to the monitoring of projected impacts upon its resource base. How effectively the environmental guidelines and development framework presented in the Assessment Report and Land Use Plan are translated from planning documents to an operational programme will depend on the management capabilities of the public sector.

Unfortunately, the institutional framework for implementation of national or sectoral plans remains weak in the Caribbean (World Bank, 1983). Characterized by an insufficient data base, shortage of well-trained staff, inadequate cooperation among government agencies, and even poorer links between planning and budgeting offices, the institutional capacities of Caribbean governments need to be strengthened if plans are to be effectively linked to policy mandates, institutional structures, action-oriented decision-making, and orderly growth.

This is not entirely a question of providing additional resources for agencies charged with plan implementation. It is also important for public managers to identify and employ strategies which integrate planning with public policy decision-making (World Bank, 1983). Implementing the Land Use Plan and Environmental Protection Programme for the Southeast Peninsula can help accomplish this broader objective by: (1) mobilizing public support for national planning and land use goals and (2) providing a framework within which Government can improve inter-departmental coordination, expand information exchange networks, and upgrade technical skill levels.

### B.3.2 Management System Alternatives

Several administrative arrangements are available to the Government of St. Kitts and Nevis in institutionalizing oversight responsibilities for land use and environmental management functions relative to the Peninsula. A few of the more obvious, including the strengths and weakness of each, are:

(1) Concentration of authority and responsibilities in a traditional line ministry. The economies of scale associated with any centralising arrangement will ensure optimization of limited resources. Further, programmes located within line ministries are more likely to survive institutionally over time. However, the vested interests of an entrenched bureaucracy, particularly in the classically hierarchical administrative structure of Eastern Caribbean governments, may impede development of a new agency since such interests are traditionally reluctant to share power and suspicious of change.

(2) Creation of a semi-autonomous body within a national ministry. The strength of such an agency is proportional to the support it enjoys at the national level. While its semi-autonomous status enhances its flexibility (in comparison to a traditional government body), the agency's mission will usually have a lesser priority within its home ministry by virtue of the fact that it is not an integral part of the "system."

(3) Establishment of an inter-ministerial coordinating body. The creation of an integrative network of persons from various departments concerned with a common problem constitutes an alternative approach to administering a programme or executing policy without having to make the adjustments necessary when new bodies are created. The problem with such an approach, however, is that members of the coordinating "council" often find it difficult to establish a new level of institutional loyalty, and their continued ties to originating departments impede the effectiveness of the coordinating, integrative function.

(4) Concentration of authority in a new or existing unit of government and creation of an interagency council to support that unit. This approach combines many of the strengths of the alternatives suggested in 1-3. For example, while existing agencies will be reluctant to support a new or sister agency if it means a loss of function, the formation of an integrative, oversight body will tend to lessen such apprehensions.

Nevertheless, the overall effectiveness of the strategy will be dependent on the political will of the national government to support the executing agency and to give substantive responsibilities to the coordinating council.

It is recommended that the Government of St. Kitts and Nevis select the latter approach for implementation of an environmental protection programme for the Peninsula. It is further recommended that a new arm of the Planning Office be created for this purpose, to be known as the Environmental Management Unit (EMU), and that the oversight, monitoring, regulating, and enforcement responsibilities of that Unit be strengthened by establishment of an inter-departmental coordination council comprised of appropriate technical persons from other government agencies.

### B.3.3 Environmental Management Unit (EMU)

Generally speaking, governments tend to make only marginal adjustments in existing institutions when initiating new programmes or executing new policies. This bias in the case of Eastern Caribbean governments derives largely from traditional theories of public administration which dominated the colonial period. A continuing emphasis on centralised structures, control functions, and prescriptive efficiency has contributed to bureaucratic preferences which often discourage change or innovation. Reluctance to delegate authority or take initiative impedes institutionalization of new programmes or policy directions.

At present, the Government of St. Kitts and Nevis recognises the need to expand its responsibilities with respect to management and protection of the physical and natural resource base of the country. At the same time it is cautious about overextending its functions beyond current financial and technical capabilities. It is recognized that such cautionary concerns might impede the effectiveness of any agency assuming environmental management responsibilities. Therefore, it is important that the designated authority be placed within that Government unit which can at present best meet the following requirements while demonstrating a capability to ultimately expand its functions:

- able to efficiently draw upon existing expertise and presently functional channels of communication and information flows (both formal and informal),
- be the least intrusive or "threatening" to collaborative agencies during its developing years,
- possess sufficient institutional leverage to ensure timely implementation of its mandate,
- have access to adequate resources to carry out its designated responsibilities.

It is also important that the task assignments of the new EMU be defined so as to allow for an incremental expansion of Government's capacity to cope with accelerated management and regulatory functions. Therefore, at least initially, EMU responsibilities should focus on the Southeast Peninsula. Specifically, the Environmental Management Unit, as an operational unit of the Planning Office, should:

- Serve as the Government's technical advisory arm for environmental affairs;
- Assist other Planning Office personnel in establishing procedures for the submission and review of development applications for Peninsula projects, including compliance standards for EIA's;
- Prepare technical evaluations of development applications, especially of Environmental Impact Assessments, to ensure conformity with standards established in the Land Use Plan;
- Solicit, as appropriate, input from other Government departments in the review of development applications and impact assessments;
- Assist the Planning Office in preparing recommendations on Peninsula development applications for forwarding to the Minister;
- Monitor construction of development projects on the Peninsula and enforce compliance with building standards and environmental protection regulations established in the Land Use Plan;
- Provide technical advice and assistance to the Development Board when so requested.

While the newly created (1984) Ministry of Natural Resources and the Environment is seemingly the logical ministry to house the EMU, it is not yet fully established or functional (nor are there any firm indications that this will change in the near future). This Ministry will perhaps eventually perform overall environmental management functions in St. Kitts and Nevis. However, until a decision is made by Government to define both the mandate and the administrative structure of the Ministry and because the environmental oversight requirements associated with development of the Southeast Peninsula are more immediate, it is recommended that an Environmental Management Unit be established immediately and that this agency be in place prior to commencement of road construction.

(revised)

The Unit should initially be placed within the Planning Office, which has been the lead Government liaison agency with USAID for funding of the Peninsula road and regarding overall development of the area. The location of the EMU within Planning will thus provide continuity from the planning to project implementation phases of Peninsula development. While its responsibilities will initially focus on the South-east Peninsula, they could extend eventually to the entire country by a relocation of its functions from the Planning Office to the Ministry of Natural Resources and the Environment.

It might be argued that placement of the EMU within Planning will diminish the importance of its functions. Traditionally planning agencies are often by-passed in government decision-making processes (unless they are established within the Ministry of Finance with crucial linkages to budgetary functions). Planning agencies tend to become advisory in nature, particularly when their attempts to plan in an orderly fashion are regularly over-ruled or ignored by Cabinet-level decisions. To overcome this tendency, it is important for planning units to recognize the functional yet critical position they occupy in government as the repository of information, in this case information on effective management of the environment. The availability of crucial information and the ability to act on that information in a timely and competent manner are, in effect, tools by which a planning agency enlarges its capacity to influence policy-level decisions. For this to occur in St. Kitts and Nevis with respect to the EMU, however, several prerequisite changes are essential.

For example, at the present time the role of the Planning Office is not entirely clear regarding SEP development activities. Planning shares certain technical responsibilities with the Central Housing Authority (CHA) for review of building applications and monitoring of provisions contained in the Building Ordinance and Land Development Ordinance. However, this informal division of effort which has evolved over time is an ad hoc one, rather than one prescribed by law. Both agencies are located within the Ministry of Agriculture, Lands, Housing and Development, and the Permanent Secretary of that Ministry designates technical review functions between the two agencies. Personnel at both Planning and CHA assert that good control has been maintained and respective staffs work well together, despite the ambiguity of mandate (personal communications, March 1986).

Secondly, input by technical units within Government in the consideration of development plans is not a formalized procedure at present. The Land Development (Control) Ordinance requires that the Minister of Development approve plans for "development of land in the State." Presumably when development plans affect the tourism sector, the Ministry of Tourism and Labour becomes part of the decision-making process. However, technical input by appropriate government units in the review of development plans has not been guaranteed through enactment of rules and regulations which would (1) standardize development application procedures or (2) require technical staff recommendations prior to application approval.

This situation is subject to change in the near future. Adoption by Government of a Land Use Management Plan for the Southeast Peninsula, supported by environmental impact assessment procedures and establishment of an Environmental Management Unit within the Planning Office will provide an appropriate administrative framework to achieve the environmental goals and integrated development strategy proposed for the Peninsula. It will also establish the institutional structure and operational procedures for improving, over time, the overall resource management capabilities of the public sector.

However, as has been pointed out elsewhere (USAID/NPS, 1981), effective operation of natural resource management programmes by governments requires public sector consensus as to general objectives, sufficient political will to support those objectives, and skillful communication of programme goals to the mass of people. There is little point in determining land management policies or environmental protection standards, from both a conservation and economic standpoint, unless the political and social means are available to carry these out. This will require close liaison among government leaders at the Cabinet level, coordination of environmental activities at the technical level, and contact with non-government "user" groups who are impacted by governmental regulation of the resource base.

#### B.3.4 Inter-Departmental Coordination

It is recommended that the oversight, monitoring, and enforcement responsibilities of the Environmental Management Unit be strengthened by establishment of an inter-departmental coordination body, to be known as the "Technical Review Council."

The creation of the Environmental Management Unit as the focal point for regulatory activities will not eliminate the need for other coordinating mechanisms within Government. The responsibilities of the EMU will not fit neatly into a single agency organisational chart, for implementation of a comprehensive environmental protection programme for the Peninsula crosses sector boundaries (including the technical concerns of the Planning Office, Fisheries Unit, Public Works, Central Housing Authority, Ministry of Education, etc.). Implementation responsibility should focus on the EMU but will be strengthened if an inter-departmental council is created to encourage an information exchange, sharing of technical expertise, cross-sectoral training activities, and pooling of data. Inter-agency cooperation of this type will be particularly important as the pace of development for the Peninsula increases and Government is confronted with a series of applications for development projects, each requiring technical review of the prerequisite Environmental Impact Assessment.

In effect, the Technical Review Council represents an extension of the technical expertise of the Planning Office/Environmental Management

Unit, and its establishment will help to ensure that development projects for the Peninsula:

- (1) meet Government guidelines and standards;
- (2) are technically and environmentally sound;
- (3) do not overload the capacity of present systems to cope with Peninsula growth;
- (4) have no hidden, long-range costs to the State;
- (5) are compatible with other Government goals and projects.

The Council also represents a logical extension of the Technical Resource Committees established by Government to assist Island Resources Foundation in the preparation of the Environmental Assessment Report and the Land Use Management Plan. A precedent has been set for the Planning Office to make use of an inter-departmental organisational structure to coordinate technical functions relative to the Peninsula, and this should be continued through all phases of Peninsula development.

It is recommended that the Technical Review Council consist of representatives from the following agencies, with the Director of Planning (or his assistant) serving as Chairperson of the Council:

- Ministry of Tourism and Labour
- Physical Planning Unit
- Central Housing Authority
- Fisheries Unit
- Ministry of Education, Health and Community Affairs  
(for coordination of environmental health issues and establishment of an Environmental Education Programme)
- Ministry of Communications, Works and Public Utilities  
(specifically representatives of the Electricity Department, Water Department, and Public Works Department)
- Agriculture Department (specifically the Forestry Division)
- Police Department.

Membership on the Council should be expanded when additional input from appropriate Government personnel is required, for example, a park specialist when the proposed National Park Legislation becomes operational, a representative from the Port Authority (for marina issues), or from the Frigate Bay Development Corporation. The Planning Office should have authority to coopt expertise from other Government departments when such assistance is required for review of Environmental Impact Assessments.

Regular meetings of the Council should be convened, and procedures should be established for its functional operations. This body will

also have responsibility to review SEP development applications, to establish "conditions" of a technical nature to accompany the proposal, and to issue a formal endorse/reject sign-off on proposals when forwarding its recommendations to the EMU/Planning Office. Perhaps more formalized working agreements between units of Government might be developed to include resolution procedures when conflicts arise and an accountability and archiving structure to reduce redundancy and enhance access to information.

The need for responsible departments to understand and utilize coordination functions is particularly important when regulatory processes have not previously been centralised or when overall monitoring authorities are spread among several departments (as will continue to be the case in St. Kitts and Nevis since, for example, fisheries regulations will not be enforced by the Planning Office). Yet, generally speaking in the Eastern Caribbean, there has been no strong impulse within government bureaucracies to build cross-linkages with related or complementary activities of other agencies or management units. Further, when attempts are made to build bridges within a bureaucratic structure where such links had not been formed previously, the result has often been confusion and an atmosphere of suspicion rather than cooperation (see Towle, J. and E., 1985).

Lead agencies must, therefore, be responsive to such apprehensions about the "control factor" buried within any coordinating activity. It is important to identify incentives which ensure the ready participation of collaborating agencies and persons who otherwise associate coordination with externalized control and loss of function. For example, if responsibilities related to serving on the Technical Review Council are viewed by participants as competitive, distracting or time consuming, their cooperation will be marginal. If on the other hand participants identify a vested self-interest in such activities (i.e., access to information or expertise, involvement in training programmes, etc.), they are more likely constructively to take on the additional responsibilities. Further, as the Technical Review Council broadens its horizons to include a broader range of activities associated with environmental management and this expanded perspective produces a net benefit to the Planning Office, such positive experiences should make the Planning Unit and its parent ministry more amenable to taking additional steps toward integrated management strategies for the entire country (see Sorenson, et al., 1984).

### B.3.5 Training Requirements

Discussions with the Government Training Officer (Hobson, personal communication, March 1986) confirm that there are at present no persons from St. Kitts and Nevis involved in training programmes off-island in areas of environmental management related to the long-term development needs of the Peninsula. Further, only one person now associated with Government (other than external consultants) has formal training or expertise in environmental impact assessment review pro-

cedures. Finally, representatives of Government are somewhat overly optimistic about the capacity of the public sector to assume new and technically sophisticated management responsibilities for the environment without serious upgrading of current skills levels.

However, public officials have stated that should Government identify "environmental management" as a priority area for training (stimulated by proposed development plans for the Southeast Peninsula), then in the normal course of events an appropriate Ministry would incorporate this priority within its recommendations to the Government Training Office, and persons would be identified and selected for appropriate training programmes and activities. The new Centre for Resource Management and Environmental Studies (including a Coastal Zone Management Programme) at the Cave Hill Campus of the University of the West Indies is an obvious professional training possibility for Kittitians or Nevisians.

For the immediate future (i.e., perhaps the next two years during road construction and initial phases of hotel development on the Peninsula), Government should consider execution of on-island, short-term, customised and incremental training activities which would not necessitate the extended absence of trainees to attend external programmes or courses of study. Over the long-term, a combination of the two approaches might be most practical i.e., implementation of immediate, on-island training activities coupled with professional training for one or two persons at the UWI Centre for Resource Management and Environmental Studies, or its equivalent.

Whichever options are chosen, funding for such training activities would need to be identified and provided by a donor or international aid agency. Once this has been confirmed, the establishment and training of the EMU must be assigned a priority status by Government. The present Planning Office cannot with its current level of staffing, technical skills and facilities provide the guidance and monitoring needed if development of the Southeast Peninsula is to be accomplished in an efficient and environmentally sensitive manner.

## APPENDIX C

### PLANNING AND ENVIRONMENTAL PROTECTION ISSUES RELATED TO THE SOUTHEAST PENINSULA: LEGISLATIVE CONSIDERATIONS

- C.1 INTRODUCTION
- C.2 PROPOSED PLANNING LEGISLATION FOR THE SOUTHEAST PENINSULA
  - C.2.1 Current Status
  - C.2.2 Recommendations
  - C.2.3 Long-Term Considerations
- C.3 MARINE POLLUTION ACT
  - C.3.1 Current Status
  - C.3.2 Recommendations
  - C.3.3 Long-Term Considerations
- C.4 FISHERIES REGULATIONS
  - C.4.1 Current Status
  - C.4.2. Recommendations
  - C.4.3 Long-Term Considerations
- C.5 NATIONAL PARKS AND HISTORIC SITES ACT
  - C.5.1 Current Status
  - C.5.2 Recommendations
  - C.5.3 Long-Term Considerations
- C.6 COMPREHENSIVE ENVIRONMENTAL LEGISLATION FOR ST. KITTS AND NEVIS
  - C.6.1 Current Status
  - C.6.2 Preliminary Recommendations
  - C.6.3 Long-Term Considerations
- C.7 BEACH CONTROL ORDINANCE
  - C.7.1 Current Status
  - C.7.2 Recommendations
- C.8 FORESTRY ORDINANCE
  - C.8.1 Current Status and Recommendations
- C.9 WILD BIRD PROTECTION ORDINANCE
  - C.9.1 Current Status and Recommendations

## APPENDIX C

### PLANNING AND ENVIRONMENTAL PROTECTION ISSUES RELATED TO THE SOUTHEAST PENINSULA: LEGISLATIVE CONSIDERATIONS

#### C.1 INTRODUCTION

Pursuant to recommendations made in the Environmental Assessment Report (February 1986), members of the Land Use Management Planning Team continued to assist the GSKN Attorney General's Office in preparing legislation focusing on the long-term environmental management and resource development needs of the Southeast Peninsula. A progress report with recommendations concerning priority areas still to be addressed or further refined follows. The reader is also referred to Section 5 of this report which outlines suggested institutional changes which may require legislative action and to Appendix E of the Southeast Peninsula Environmental Assessment Report which summarises existing legislation relating to the environment.

Proposed or extant legislation reviewed as part of the current study includes the following, some of which focuses specifically on the Peninsula but the majority of which encompasses the planning or resource management needs of the entire country:

- (1) Planning Legislation for the Southeast Peninsula (proposed)
- (2) Marine Pollution Prevention Act (proposed)
- (3) Fisheries Regulations (pursuant to the Fisheries Act of 1984)
- (4) National Park and Historic Sites Act (proposed)
- (5) Comprehensive Environmental Protection Legislation for St. Kitts and Nevis (under discussion)
- (6) Beach Control Ordinance
- (7) Forestry Ordinance
- (8) Wild Birds Protection Ordinance.

#### C.2 PROPOSED PLANNING LEGISLATION FOR THE SOUTHEAST PENINSULA

##### C.2.1 Current Status

The Attorney General's Office has drafted legislation which creates a planning mechanism for Southeast Peninsula development. The draft provides for acquisition of land for public purposes on the Peninsula, using land values existing prior to development of the penetration road. It gives the Planning Office authority to oversee regulatory functions connected with the Peninsula's environment.

The draft act made available to the LUMP team for review (in April 1986) provides a preliminary institutional framework for SEP planning

activities, including creation of a "Policy Board" comprised of government and non-government representatives. A technical committee is to serve in an advisory capacity to provide the Board with technical assistance. The authority of both bodies would extend only to the Peninsula.

### C.2.2 Recommendations

Based on the institutional analysis provided as Appendix B of the Land Use Management Plan, it is recommended that the structure for the Policy Board and Technical Committee outlined in the current draft provide for:

- (i) creation of a Southeast Peninsula Development Board as per section 2.2 of Appendix B;
- (ii) creation of the Environmental Management Unit within the Planning Office as per section 3.3 of Appendix B;
- (iii) creation of an inter-departmental Technical Review Council as per section 3.4 of Appendix B.

It is further recommended that the draft legislation:

- (iv) should address both planning and development concerns, e.g., "Land Development and Conservation Act;"
- (v) should incorporate by reference the Southeast Peninsula Land Use Plan, as eventually adopted by Government, as the regulatory framework to guide and direct development activities for the Peninsula;
- (vi) should provide for a broad decision-making base by vesting responsibility for the review of development applications in three bodies: the Technical Review Council, the Planning Office, and the SEP Development Board; each body will issue a formal endorse/reject sign-off on development proposals and will forward its recommendations to the Minister of Development who will issue the final determination;
- (vii) should define responsibilities of the Development Board, Environmental Management Unit, and Technical Review Council, including clarification of enforcement procedures where appropriate;
- (viii) should provide the means for development of a Southeast Peninsula Environmental Protection and Management Policy with enforceable rules and regulations for the same;
- (ix) should outline requirements which standardize submission of Environmental Impact Assessments (EIA's) to

*(revised)*

accompany SEP land development applications; EIA regulations should include but not be limited to a definition of types of projects to be covered by EIA procedures; delineation of minimum building standards; setting forth of EIA review procedures; provision for appeal mechanisms.

### C.2.3 Long-Term Considerations

Implementation of planning and development legislation for the Peninsula should not overshadow the eventual need to strengthen the overall planning framework for the country, particularly with reference to environmental protection concerns. The eventual integration of Peninsula specific legislation under the umbrella of more comprehensive national planning legislation should be an option available to Government under the terms of the proposed Peninsula legislation. It is important that, over the long-term, the Government provide an integrated environmental protection and management strategy within a national framework, once an experience base has been established and tested for the Southeast Peninsula.

## C.3 MARINE POLLUTION PREVENTION ACT

### C.3.1 Current Status

A revised draft of this legislation has been prepared by the Attorney General's Office (with clerical assistance provided under the LUMP project) and is currently undergoing review.

### C.3.2 Recommendations (Detailed recommendations were provided by the Legal Advisor to the LUMP team to the Attorney General's Office in mid-April.)

The current draft focuses largely (and adequately) on marine oil pollution (oil spills) and needs a separate, strengthened section on land-based sources of marine pollution (as per the Cartagena Convention). The regime for controlling land-based sources does not, at present, have a sufficiently strong or precise regulatory framework. Specific issues relevant to Southeast Peninsula development include permitting and establishment of qualitative and quantitative discharge "limits," controls, penalties and fee systems, as appropriate, regarding sewage outfalls, vessel (yacht) waste discharges (including trash and sewage), water-borne sediments (generated by upland soil disturbance), waste engine oils, marina wastes, chemicals (especially pesticides), and abandoned, beached or sunken vessels. A discharge permit system is needed.

### C.3.3 Long-Term Considerations

The technical competence and facilities needed for administering both the IMO and Cartagena aspects of this programme are high and will require trained laboratory and compliance monitoring technicians (none are available at the present time). The needs of the State, however, require an immediate long-term education and training effort for selected nationals: one environmental (marine) engineer and one water quality chemist.

## C.4 FISHERIES REGULATIONS

### C.4.1 Current Status

Revised draft regulations have been prepared by the Attorney General's Office (with clerical assistance provided under the LUMP project). General comments were submitted by the LUMP team; only one further revision should be considered before the regulations can be finalised, presuming inclusion of the additional recommendations provided below.

### C.4.2 Recommendations

(i) Marine Reserves (as distinct from temporarily "closed areas") - The current draft does not contain adequate regulations for marine reserves (or permanently protected areas). However, once proposed sites for such reserves in the waters surrounding the Southeast Peninsula are firmly identified and profiled and consideration has been given to permitted uses and surrounding activities, regulations for the creation and management of marine reserves should be provided -- either under the Fisheries Act or the proposed National Parks Act (see below).

(ii) Closed Areas - The fisheries regulations should include clear authority to establish "closed areas," as distinguished from marine reserves. Such designation may change from time to time and is restricted to the management requirements of the designated species. Section 15 of the draft regulations mentions "closed areas" (subsection 5) but does not clarify how such areas are to be established. There is no mention of the closed areas provision under Section 13 (Lobster) and should be added.

At the present time, it is recommended that a closed fishing area for conch be declared for at least two years to include all of the shelf area enclosed by a line extending west from the southern end of Friar's Bay South to the 100 fathom submarine contour and northwesterly along that contour to its intersection with a line extending due west from Fort Thomas Point. This area contains many juvenile conch and a substantial breeding population. Further, the area can easily be monitored by the Coast Guard. As the remaining portion of the coast has ample resources to meet needs of local fishermen, the pro-

posed regulation should not exert undue hardship on harvesting activities. The regulations should stipulate that closed areas may be rotated from time to time to include other locations (or species).

Major's Bay should be "closed" for two years to lobster and seine fishing by a line drawn tangent to both promontories (Nag's Head and Banana Point), for the express purpose of experimentally managing the area as a protected nursery area for juvenile lobsters and fish.

(iii) Spearfishing Control - Except in any proposed marine reserve areas (e.g., Guana Point), spearfishing need not be prohibited at this time, but certain restrictions are needed. The Fisheries Regulations should prohibit the import or use of spearguns by non-residents (i.e., tourists). In addition, renting, using, or promoting the use of spearguns for financial gain or reward should also be prohibited. (See also Appendix G of this report.)

#### C.4.3 Long-Term Considerations

Both proposed closed areas should be considered "temporary" and "experimental" fisheries management strategies. As data accumulates from ongoing research and monitoring, boundaries may require adjustments and the target "protected species" or prohibited activities expanded, reduced or eliminated at a later date.

### C.5 NATIONAL PARKS AND HISTORIC SITES ACT

#### C.5.1 Current Status

Pursuant to recommendations made in the Environmental Assessment Report and following additional meetings (March-April 1986) with representatives of Government and from the Brimstone Hill Society, the legal advisor to the IRF Land Use Planning Team prepared detailed recommendations concerning proposed enactment of national parks legislation and followed up with presentation of a preliminary draft act ("The National Parks and Historic Sites Act") which was made available to the Attorney General's Office, the Planning Office, and the Brimstone Hill Society for review and comments.

It is important that follow-up discussions of the draft and the revision process be given high priority by Government since the Southeast Peninsula Land Use Management Plan makes specific recommendations regarding parks and protected areas for the Peninsula and (2) clarification of Brimstone Hill's status as a proposed national park is unavoidable in view of the 1986 expiration of the Society's lease with Government for management of the historic site. Government has expressed an interest in moving ahead with comprehensive protected areas legislation and views current discussions as particularly timely (Seaton, personal communications).

### C.5.2 Recommendations

Prior to making specific recommendations to Government regarding national parks legislation, a review of approaches used elsewhere in the Eastern Caribbean was carried out by the LUMP team, with due consideration given to the particular needs of St. Kitts and Nevis. For example, St. Lucia has created a national trust framework to give protected status to both natural and historic sites. Antigua/Barbuda has developed a National Parks Authority to manage park areas, while Dominica's national parks structure gives management responsibilities to the Ministry of Agriculture, Forestry Division.

However, two private sector, non-government groups (the Brimstone Hill Society and the Nevis Historical and Conservation Society) have some demonstrated capacity as well as an interest in development of a national programme for the protection and management of natural and cultural sites. The possibility, therefore, exists for St. Kitts and Nevis to use already established organisations for defined management roles while also developing the necessary oversight capacity within Government.

The draft legislation presented to Government incorporated the following specific considerations:

(i) The parks system should be comprised of both terrestrial and marine areas and should include areas of natural and ecological importance as well as sites of historical and cultural value.

(ii) The country's natural and cultural resources needing protective status generally fall into two broad management categories:

- (a) relatively small areas requiring strict protection (e.g., dunes, wildlife nesting and breeding areas, historic buildings);
- (b) other larger areas or cluster of areas to be controlled by employment of management objectives, strategies, and a framework which endeavor to protect natural, physical, scenic and/or cultural values for sustained multiple uses (e.g., Mt. Liamuiga, Brimstone Hill, the Southeast Peninsula's protected areas).

(iii) To meet international standards and criteria for inclusion in the United Nations List of National Parks and Equivalent Reserves, the primary purpose of selected areas should be conservation. To meet international criteria for potential inclusion in the World Heritage List of natural or cultural sites of international importance (which might apply to Brimstone Hill, for example), designated areas need adequate legal protection to maintain the integrity of the site's natural/cultural features.

(iv) Legislation might provide for another management category as separate from national park status: resource management areas. Objectives within such areas should be for the purpose of regulating use or uses on a sustained yield basis (e.g., slopes, forests, fisheries areas). While not meeting criteria for national park designation, such "resource management areas" are considered a legitimate protected area status using IUCN criteria. As an alternative, such areas could be protected within zoning or land use planning controls. In some combination, an assemblage of such areas -- as in the case of the Southeast Peninsula -- might best be managed collectively by one authority, i.e., the Southeast Peninsula Parks Authority, which would handle all protected areas and public recreation sites.

(v) Regulatory powers are needed to control activities within each established area. This authority could be delegated by the Minister to a competent government office (e.g., the Fisheries Division for "marine reserves"), a registered society dedicated to conservation objectives (e.g., the Brimstone Hill Society), a private individual (where the area is on private land), or an appropriately designated board or authority. Whatever approach is preferred, there is need for flexibility on a case-by-case basis. A greater degree of flexibility will allow for the inclusion of public and private land within the parks system and will provide for the immediate establishment of the system by using already established bodies while public sector environmental capabilities are being upgraded to include park management skills. (NB. We suggest a St. Kitts and Nevis "National Parks Planning Group" be assembled in the near future to review these various options and recommend a course of action to Government.)

(vi) Legislation for a national parks system should also include technical provisions which require a "management plan" for each area within the system. Management plans could be relatively simple, depending on the objectives and resources of the site, but should as a minimum requirement be used to set goals, time schedules, and guide regulation of activities. Penalties and enforcement powers are also needed. Both police officers and other officers appropriately authorised by the Minister (i.e., from the Fisheries Division) could be given arrest powers under certain well-defined conditions.

(vii) The legislative framework for the St. Kitts and Nevis National Parks and Historic Sites Act will include provisions for the incorporation of identified areas within the "system" as these are gazetted by the Minister. Designation of the Brimstone Hill National Park would be given immediate priority as would areas recommended for protected status on the Southeast Peninsula.

### C.5.3 Long-Term Considerations

In the case of the Peninsula, we foresee the emergence of a Southeast Peninsula National Park, whether it is, as recommended elsewhere in

this report, the entire Peninsula with clusters of tourism facilities inside it, or whether it is a cluster of protected landscape and seascape features assembled under the aegis of a yet-to-be-structured Southeast Peninsula Parks Authority. In either case, the Peninsula's "park areas" or "park" must fit within the embryonic but emerging hierarchy of a St. Kitts and Nevis National Park System, along with other units like Brimstone Hill (which already is a National Park) or Mt. Liamuiga and its forested craters, trails, and peaks (which could become a national park).

The Government of St. Kitts and Nevis has started to move in the direction of establishing a national parks system. It already has one -- Brimstone Hill. With the Peninsula, it will shortly add another. For the time being (and especially in the case of Brimstone Hill), it can rely on private sector management as a surrogate. But in the long-run, it will need what it does not now have -- a trained, experienced park manager (or management unit) and a well defined set of objectives, if only to ensure that conservation goals are being met and the national interest well served.

## C.6 COMPREHENSIVE ENVIRONMENTAL PROTECTION LEGISLATION FOR ST. KITTS AND NEVIS

### C.6.1 Current Status

As was noted in the SEP Environmental Assessment Report, legislation on the statute books in St. Kitts and Nevis tends to deal with environmental matters in a traditional manner along sectoral lines. Presently, cross-sectoral mechanisms do not exist in a formal structure. Recommendation was made in the EAR for some authority and structure in new environmental legislation which would cut across ministerial lines.

Following a site visit to St. Kitts in April (1986), the legal advisor to the Land Use Planning Team made a further assessment of the environmental legislation needs of the country and suggested alternative approaches (see C.6.2) for addressing the concerns detailed in the Environmental Assessment Report. Additional consultations with the staff of the Attorney General's Office, with the Planning Unit and with other affected ministries and departments will be necessary to design appropriate legislative changes and amendments that integrate sectors within a comprehensive protection framework. Further, in order to define enforceable environmental standards which are consistent with national policy, Government should clarify its national environmental goals within a country-wide framework, taking into account also the goals and objectives of individual ministries but integrating this into a national strategy.

### C.6.2 Preliminary Recommendations

Generally speaking, environmental legislation comes in a variety of forms and includes an appropriate mix of pollution control measures and natural resource conservation. The range of possibilities for specific environmental machinery is broad, depending on the specific needs and concerns of each country, varying from establishment of a coordinating unit across sectors to creation of a comprehensive implementation unit responsible for technical oversight and enforcement of all sector environmental laws and standards. Usually some middle-ground between these two alternatives is most appropriate because a mere coordinating unit will lack adequate authority and become only advisory in nature, while a comprehensive agency may not be administratively or economically feasible.

At the present time the Government of St. Kitts and Nevis is able to deal with some coordinating functions (see recommendations for the establishment of a Technical Review Council in Section 3.4 of Appendix B). The creation of a national physical planning board, with cross-ministerial composition, might also be a means of strengthening the country's planning capacity and of providing more effective coordination for implementation of environmental management objectives.

For the short-term, therefore, it is recommended that Government defer on seeking comprehensive environmental legislation and focus on improving resource management capacities by systematically adding environmental protection responsibilities and functions to the appropriate ministerial portfolios. Such assignment should be as specific and issue-based as possible, especially in education, agriculture, industry, forestry, fisheries, public health, planning. Government can thereby encourage a strengthening and growth of institutional capabilities without immediate implementation of a new and comprehensive body of environmental law. As institutional skills at the technical level are improved, cross-ministerial sharing of expertise on environmental problems will be more easily achieved. While the Planning Office especially needs the authority to utilize personnel from other departments to address cross-sectoral problems, the principle also applies in reverse if the state's environmental resources are to be well served and properly cared for by Government. All environmental issues cut across ministerial boundaries.

### C.6.3 Long-Term Considerations

Enactment of land development and conservation legislation for the Southeast Peninsula (see C.2 above) will enable Government to gain experience, train personnel, establish guidelines, and test procedures within an integrated environmental protection and resource management framework. Eventually this experience base can be broadened to encompass more comprehensive environmental protection legislation for the country.

## C.7 BEACH CONTROL ORDINANCE

### C.7.1 Current Status

The Beach Control Act vests all foreshore and the floor of the sea in Government (Section 3). The limited exceptions to this Government ownership apply to Basseterre and Charlestown harbours, agriculture or fishing, and other rights existing prior to commencement of the Act (Section 10). The "foreshore" is not defined in the law but can be read to mean the tidal zone because "adjoining land" to the foreshore is defined to mean land extending 50 yards beyond the landward limit of the foreshore (Section 2). The Act is clear that except for those few exceptions defined, any use or encroachment on the foreshore or floor of the sea for a public or business purpose is prohibited without a licence from the Minister (Section 4). The Minister, when reviewing an application for a licence, is required to consider any public interest that might need protection in regard to anticipated future development of the land adjoining the part of the foreshore in which the application is made (Section 5). The Minister is authorised to include terms in the licence to protect such interests (Section 5). Thus, the Act contains a framework for controlling activities on the foreshore of any beach and, to a certain extent, adjoining lands.

Finally, the Act contains a separate provision for acquisition by Government of any adjoining land for use by the public. Government has the responsibility to determine public needs and requirements in the use of such land (Section 6). Government is authorised to make agreements to acquire (or, alternatively, compulsorily acquire) the interest in land adjoining the foreshore for public use (Section 7).

### C.7.2 Recommendations

It is the assessment of the Land Use Planning Team that authority exists under the current Act to address concerns about protection of the public interest in development of the Southeast Peninsula's beaches. However, it is also clear that the impact of the legislation would be strengthened if regulations were in effect which more clearly define the control procedures available to Government under the law. The Act gives power to make regulations in several areas, including licences, fees, sanitation, safety, construction, etc. It is, therefore, recommended that the drafting of regulations under the Beach Control Ordinance be given priority by Government, certainly prior to commencement of building activities on the Peninsula.

Areas of concern requiring more specific regulations are:

- (i) Permits and leases for facilities on the foreshore or seabed (i.e., private docks, jetties, seawalls, piers, channels, ramps and pipelines);

- (ii) Sand mining -- coastal and marine
  - (a) Beach sand - prohibited with severe penalty for violation
  - (b) Marine seabed sand - allowed by advance permit with yardage fee and EIA required;
- (iii) Sand mining -- inland/dune sand
  - (a) Allowed in specified area by permit
  - (b) EIA required (see Appendix K);
- (iv) Removal of vegetation from beach, berm and dune areas
  - (a) Expanded definition of setback area
  - (b) Definition of permissible and non-permissible uses
  - (c) Fine for violation.

## C.8 FORESTRY ORDINANCE

### C.8.1 Current Status and Recommendations

The Organization of American States has recently assigned a forestry consultant to St. Kitts for two years to assist in the development of a forestry management programme. As goals as well as problems and concerns are defined under that project, Government -- through its Ministry of Agriculture -- should give attention to appropriate amendment of the Forestry Ordinance.

## C.9 WILD BIRD PROTECTION ORDINANCE

### C.9.1 Current Status and Recommendations

As detailed in the SEP Environmental Assessment Report, this legislation requires amendment to (1) update the species lists included therein; (2) insure that dates for closed seasons accurately reflect nesting periods; (3) increase penalties for violations. Consideration should also be given to enactment of a more comprehensive Wildlife Protection Act to include mammals and reptiles as well as birds. Since opening of the Southeast Peninsula will increase access to the area by hunters, egg harvesters, and other visitors, it is important that the recommended changes in the wild bird protection law be made prior to completion of the road and, further, that adequate enforcement procedures are in place.

## APPENDIX D

### UTILITIES AND ROADS

#### D.1 UTILITIES

##### D.1.1 Electricity

The present electric generating capacity in St. Kitts is 8.4 megawatts (MW). The peak electrical load for the year is usually experienced around Christmas time. For 1984 it reached 5.6 MW, and for 1985 it was approximately 6 MW. The electrical generating plant has a number of older generators, some of which are periodically down for maintenance and repair; therefore, as announced by the Prime Minister in his 1986 Budget Address, the Electricity Department is seriously considering an upgrade. Electricity demand has grown on the average of five to six percent per year, but this figure can be expected to accelerate slightly as a consequence of projected hotel and residence construction on the Southeast Peninsula.

The IRF Land Use Planning Team surveyed two hotels to establish a working base figure for electricity consumption per hotel room. The first hotel investigated, The Ocean Terrace Inn, had 40 rooms and a 71.8 occupancy figure for the period of time for April 1984 through March 1985. The cost of electricity for the 12 months was EC\$100,770, which at EC29.2 cents per kilowatt hour resulted in a consumption rate of 999 kilowatt hours per unit per month. In the case of the second hotel, the Jack Tarr Village complex with 234 units for a five-month period (October 1985 to February 1986), the average electrical usage works out to 790 kilowatt hours per unit per month with a high of 949 kilowatt hours for the month of October 1985 (hot and dry) and 730 kilowatt hours for February 1986 (a much cooler, wetter month which resulted in lower air conditioning loads).

Based on discussions with and documents provided by the manager of the Electricity Department (GSKN), the following recommendations and cost estimates regarding the provision of electrical power to the Southeast Peninsula have been developed by the IRF team:

- a) The electrical system would be entirely underground with an 11,000 volt feeder line and with outdoor substations stepping the voltage down to 415-240 volts. Placing the main feeder line underground has advantages from both an aesthetic and maintenance point of view as it minimizes the risk of corrosion from salt air and from damage due to hurricanes.
- b) The main supply feeder would be taken directly from the power station rather than having the circuit added to the present Frigate Bay/Pond Estate Industrial Site Feeder.

- c) Initially, a total of 2500 KVA of transformer capacity would be installed on a ring main system at the southern end of the Peninsula.
- d) For 800 hotel units on the Peninsula a transmission capacity of 2.5 MVA would be required.
- e) An alternative method of supplying the area (which could be considered if the initial development is concentrated at the southern end of the Peninsula) would be for the supply line to be run by a submarine cable along the western side of the Peninsula. This option could also be utilized at a second stage when the number of hotel rooms on the Peninsula exceeds the capacity of the main line running from Frigate Bay down the spine of the Peninsula along the road.

The proposal to install simultaneously buried water mains, electricity and telephone cables during the actual construction of the road needs to be considered carefully as the strategy may be difficult to realise in practice. Since the telephone company, Skantel, intends to utilize pvc ducts through which cables can be run at a later date, electricity cables could also be laid in parallel pvc ducts installed in the same trenching process. However, this has the serious disadvantage of derating or lowering the current capacity of the cables by about 15 per cent. Furthermore, the relative costs of the ducts is a factor to be considered before a decision is reached.

Each development site on the Peninsula of any significance should be required to have emergency generator capacity to be used in the event of failure of the main and only feeder line, to run critical lighting, water pumps, sewage pumps and emergency systems.

It is also noted that the average production cost, including equipment write-off, for electricity in St. Kitts is presently in the order of EC36.75 cents per kilowatt hour. Since the current charge for electricity is EC29.24 cents per kilowatt hour, this means that Government is subsidizing all electricity consumption in the amount of approximately EC7.5 cents per kilowatt hour. It is recommended that Government give consideration to raising the electricity charge for the Peninsula to a level sufficient to cover costs.

Furthermore, since the Peninsula has a very high incidence of sunlight (as opposed to cloud cover), it is recommended that mechanisms be put in place to encourage if not require all hotel, condominium, residential and commercial development activity on the Peninsula to install solar heaters for hot water requirements. These can be easily plumbed in series with supplemental, small electric, oil or gas fired back-up water heaters for use during occasional cloudy weather. This would be especially important if the rate charged by Government for the electricity continues to be less than production costs. At even the present electricity rate of EC29 cents per KWH, passive solar heater in-

stalling costs could easily be amortized in under seven years -- probably less. They offer both a high degree of protection against visitor dissatisfaction caused by outages and lower total costs to the developer in the medium-to-long-term.

#### D.1.2 Water Supply

##### D.1.2.1 Current Status

The total average water consumption on St. Kitts is 2.5 million gallons per day (MGD), for domestic, commercial and industrial uses. This is provided by a surface water collection system which is drawn principally from the central mountain area and which varies in quantity with seasonal changes in rainfall. During periods of low rainfall, an estimated deficiency of about 800,000 gallons a day occurs. Since the surface water supply has been developed more or less to its full capacity, a drilling effort is presently underway by the Canadian International Development Agency (CIDA) designed to make up the deficit and provide for long-term growth in demand. The safe yield from groundwater resources is estimated, island-wide, at 15 million gallons per day (MGD), based on a study done by Sir William Halcrow and Partners in 1966. The Basseterre Valley itself is estimated to have a safe yield of 2.5m gallons per day. The Canadian investigation should provide an update on these estimates done twenty years ago.

As for the future, assuming a domestic population increase of approximately two percent per annum, the Water Department (GSKN) foresees no water supply problems although this does not take into account development of industrial enterprises with large water demands. The Frigate Bay development site, when developed to full capacity, will use approximately 1 million gallons per day. At the present time, there is a 900,000 (imperial) gallon reservoir system situated on Morne Hill, between Bird Rock and Frigate Bay, which is supplied by a 10-inch main.

The cost of water production and distribution is EC\$1.40/per 1,000 gallons, and water rates range from 9 cents per 100 gallons per month to 18 cents per 100 gallons for usage over 8,000 gallons per month for domestic use. For non-domestic use the rate is 15 cents per 100 gallons, but this rate is scheduled for a 25% increase as announced in the Prime Minister's Budget Address in March, 1986. For 1986, the recurrent expenditure budget of the Water Department is EC\$905,354.

##### D.1.2.2 Southeast Peninsula Water Projections

For planning purposes we have assumed development of 1,300 units by year 10 and double that number for year 20, with approximate water uses of 400,000 and 800,000 gallons per day respectively. To provide for this volume of water, the Water Department projects a need

for an 8 mile 10-inch water main from Frigate Bay to the Great South Pond area plus 7,000 feet of 6-inch feeder pipe plus the installation of a booster station at Frigate Bay and two 1,000,000-gallon reservoirs. One reservoir would be situated on Sir Timothy Hill and the other in the South Pond area at a high enough elevation for gravity flow to the users on the southern end of the Peninsula.

The cost estimates for the above system, provided by the Water Department, are as follows:

Watermain 10" (Permastram), Coupling etc.	EC\$1,531.831
Transportation	119,700
Trenching	971,750
Labour	463,750
Contingencies	308,704
Booster Station	<u>143,750</u>
Subtotal	3,539,485
Reservoirs (2 M G x 2 @ EC 2.50/gallon)	<u>\$6,250,000</u>
	EC\$9,789,485

It is conceivable that the two 1,000,000-gallon reservoirs could be deferred and smaller reservoirs at a size of about 300,000 to 500,000-gallons apiece installed to serve the first phase of SEP development needs. This would lower the initial cost by a significant factor, and the storage system could be expanded at a later date when water demand increases on the Peninsula, and the locational data on "demand" centers is more precise.

Furthermore, it would allow time to explore the dimensions of the large lens of freshwater (not brackish) underneath the vast archaic sand dune system that lies between Sand Bank Bay and the northeastern edge of the Great Salt Pond. Fresh groundwater has been documented from the southern and central dune areas, and the seepage from the lens into Great Salt Pond (as confirmed in aerial photos) is estimated at 23,650 cubic meters/year (5.25 million U.S. gallons) or at an average rate of 14,000 gallons per day -- enough for a 50 room hotel. This would make a superior emergency water supply for the southern Peninsula area or could be tapped for horticulture, landscaping, irrigation or golf course use.

In order to provide a proper incentive for both water conservation and the re-use of waste water for irrigation purposes (after treatment), it is recommended that Peninsula water rates be raised to approximately EC30 cents per 100 gallons. This will make it more economically attractive to utilize waste water for irrigation (thereby contributing to beautification and landscaping efforts on the Peninsula)

and at the same time provide a shorter pay-back time on investment in the water system itself. Furthermore, increased rates will lend encouragement to adoption of an appropriate sewage treatment system using lagoons and re-cycling of effluent after chlorination for landscape water (see Environmental Assessment Report, 1986). It would, of course, be possible to have the higher rate apply only to commercial establishments and to maintain the present rate structure for all other classes of users, although this would result in continued subsidized water costs for service to relatively expensive residential housing.

For both conservation and public health reasons each new commercial establishment on the Peninsula should be required to have full gutting and downspouts feeding to potable water cisterns with a capacity for a minimum of two day peak use storage. A better rule of thumb would be at least one gallon of cistern storage capacity for each square foot of roof area on all buildings. Stored cistern water offers improved fire protection, with lower insurance rates, and provides the assurance of continued essential water supply in the event of flow interruption in the single water main from Frigate Bay.

It is noted that the cost figure of EC\$9.8 million for the water system may be high because it is quite unlikely that a 10-inch main will be needed for the entire length of the Peninsula. It is more than likely that a 10-inch main to White House Bay linked to a variety of 6-inch feeder mains to various tourism facility development sites on the perimeter of the Great Salt Pond Basin (for example, Sand Bank Bay, Mosquito Bay, Banana Bay, Cockleshell Bay), would more than suffice, thereby resulting in a significant capital cost reduction. Furthermore, it is also quite feasible for the landowners to bear the cost of linking their developments to the water main system. Therefore, some of the cost of the water distribution network would not be a public expense but would be borne by each landowner/developer.

It is recommended that at the earliest possible date a series of design and costing scenarios should be developed by the Water Department to establish the best system and least-cost strategy for providing potable water in support of the Southeast Peninsula development strategy. The attention of the St. Kitts Government is directed to a recently developed micro-computer programme for improved water and waste disposal system design. This new (1986) micro-computer programme, developed for the United Nations Development Programme by the World Bank, has recently been made available to the Water Department by the Island Resources Foundation.

## D.2 ROADS

### D.2.1 Feeder Roads

While it is assumed that the responsibility for constructing feeder roads lies with the landowner/developer, there may be occasions when

construction of a public feeder road is required -- for example, to the public jetty, to a public beach and parking area, to a public quarry or sand-mining site, or to a solid waste disposal site, if one or more of these is acquired and developed. Assuming no rock excavation and a design requiring two courses of crushed stone layers with an asphalt binder, the Public Works Department (GSKN) has estimated the cost at EC\$25 per square yard. Using this figure and assuming a 5.5 meter (18 ft.) wide road surface, the cost works out to EC\$264,000 per mile or 163,000 per kilometer. This figure does not, however, include any required culverts and headers to maintain drainage, and in many locations it would be essential to install these.

Since there is at present no organisation other than Public Works to constructs roads on St. Kitts, it may well be that the landowners/developers will contract with Public Works to construct required feeder roads. In any event, it is assumed that all feeder roads built would be constructed to specifications provided by Government. Because of the importance of the providing adequate drainage for road construction, all proposed road building activities should be preceded by the development of a road plan and an impact assessment for the proposed construction, with specified road routing and design well defined along with specified impact mitigation strategies, especially regarding drainage and erosion control.

Whether private or public, on steep terrain (over 20%) all feeder roads should have upslope rock-lined drains, mortared headers for all culverts and down slope sediment traps on all major guts or drainage-ways. Gabion or hand-laid stone wall facings on downslope road fill areas are preferred as this reduces both sediment loss and the visual scar effect while producing a more stable roadway.

Feeder roads on the Land Use Maps (#1, 2, and 3) which accompany this report reflect a presumed movement of people more than a preferred routing of any eventual road. A feeder road plan should be developed jointly by Public Works and the appropriate landowners.

#### D.2.2 Parking Facilities

Since it may be necessary for either Government and/or private developers to construct parking areas to regularize the format for vehicle parking (which would otherwise cause damage to vegetation), the Public Works Department has provided estimates of the cost for constructing parking facilities. A top-quality area with crushed stone and an asphalt binder is estimated at EC\$25 per square yard, but for a simple four-inch thick gravel parking lot of one-half acre in dimension (75 to 100 cars), cost would be EC\$10,000 per half acre if local materials are used and EC\$22,000 per half acre if gravel is hauled from the crusher. This figure of course does not include fencing or signs, or the cost of landscaping or vegetation screening which is desirable (as car parks, for aesthetic reasons, are best hidden from view as far as possible).

## APPENDIX E

### SEWAGE DISPOSAL

#### E.1 INTRODUCTION

For most types of development anticipated for the Peninsula, two primary factors interact with respect to sewage disposal:

1. The type, density, area, size, and location of development, and the volume and rate of sewage flow; and
2. The nature or characteristics of the receiving medium onto or into which the treated sewage is temporarily or ultimately disposed.

Two principal disposal mediums are available -- the land and the ocean. Ocean disposal of sewage is possible and should be considered if and when the cost of alternative disposal on land becomes significant or environmental and other impacts become unacceptable. Ocean disposal is costly due to the generally high cost of marine investigation, planning and construction. All marine operations must be carried out on barges and ships which incur operational costs of hundreds to thousands of dollars per day. Location of marine sewage outfalls must be well planned to avoid the return of the waste by wind or currents to coastal waters and beaches. In summary, the planning and construction of ocean outfalls is a costly undertaking.

Therefore, land disposal of sewage is recommended for the Southeast Peninsula during initial development years. However, it should be realized that at some point in time a level of development will be achieved on the Peninsula to make the ocean outfall option a viable, and probably necessary, solution. All planning and installation of sewage facilities should bear that future option in mind. Probably only one central plant and one sewage outfall will be economically feasible. It may be advisable to prepare a master sewage plan for the Peninsula early on so that necessary right-of-ways and a site for the sewage works are reserved.

The denser the development, or the larger the size, i.e., the more human activity, the higher the sewage flows. For practically all the development on the Peninsula, the more usual domestic sewage is expected. Industrial or manufacturing type sewage flows, which may require special treatment processes, are not expected. The use of salt water for toilet flushing will not be compatible with the land disposal of treated effluent, as discussed below.

## E.2 LIMITATIONS

The disposal of treated sewage effluent on land will be greatly affected by the type, slope and depth of soil. Generally, deep, well-drained soils present the fewest constraints on how sewage is disposed. If rock is encountered within the first few feet from the surface, than sewage disposal becomes difficult and at times impossible without creating health hazards and other undesirable consequences. Steep land also poses problems as underground sewage flows can emerge at the surface downslope, and usually the surface soil cover is relatively thin.

As a consequence, the sewage disposal options are more limited on the steeper than on the shallower slopes. The predominant soil groups found on the Peninsula (Lang and Carroll, 1966) are:

SOIL	DOMINANT SLOPE: RANGE (%)	DRAINAGE THROUGH SOIL	EROSION HAZARD	SPECIAL MANAGEMENT PROBLEMS
BIRD ROCK Loamy Sand	2-10 (4-18)	Rapid	Gullyng on steeper slopes	Moisture, conservation, stoniness
CONAREE HILL Loam	5-20 (9-36)	Moderate	Moderately Low	Stoniness
SIR TIMOTHY'S Clay Loam	15-35 (27-70)	Moderate	Topsoil easily lost	Shallow soil on steep slopes

The Bird Rock loamy sand is largely found in the low lying areas adjacent to the beach sites, i.e., Friar's, Sand Bank, Cockleshell, Banana, Mosquito and Major's Bays, as well as around the Great Salt Pond. These areas are also most suitable from a standpoint of denser development, i.e., tourist resort facilities. This soil is to a large extent the material eroded from the steeper surrounding terraces which has been deposited on the shallow sloped outwaste fans at the base of the hills.

Both the Conaree Hills and Sir Timothy's series are essentially the same soil type, their principal difference is the land slope range. The Conaree Hill's soil forms are slopes of 5 degrees to 20 degrees (9-36%), whereas the Sir Timothy's series lies on the steeper slopes of 15 degrees to 35 degrees (27-70%). This steeper slope has resulted in a thinner soil cover of the Sir Timothy's soil type.

In sum, the fewest limitations are present with the relatively deep soils generally located inland of the beaches and around the salt ponds. The greatest limitations are found on the steep slopes with minimal soil cover.

### E.3 OPTIONS

The section below will discuss the sewage disposal recommendations for the various development schemes presented by this land use management plan, namely:

- high density tourist development with proximity to the beaches
- moderate density residential development
- light density residential development
- other associated commercial uses such as marinas.

#### E.3.1 High Density Development

Much of the high density resort development is expected to center around the beach areas. This will locate much of that type of development onto the relatively thick Bird Rock loamy sand soil. For high volumes of sewage flows generated by hotels, generally in the order of tens of thousand's of gallons per day, the use of septic tanks and drain fields becomes unacceptable and problematic. For example, a 200 room hotel, with sewage generation of 270 gallons per day per room, will produce approximately a 54,000 gallon per day sewage flow. The treatment efficiency of septic tanks is only about 30%, thus a high volume of only partially treated waste would need to be disposed through extensive soakaways. Sewage treatment works which produce a high quality effluent are required. Several options are available, they are presented in Table 4.1 of the EAR, with a relative ranking of important parameters.

Our recommendation is that priority should be given to the system least costly and most trouble-free to operate and maintain -- the aerated (facultative) lagoon.

All systems, except the aerated (facultative) lagoon, are to some degree linked to moderate or high energy consuming mechanical systems, which will need a commitment of trained operators, investment in spare parts, and a standby energy source (electric generators in the event of a power failure) to ensure their continually effective operation. The facultative lagoon is our recommended choice in that it offers a treatment system with a high degree of reliability, i.e., independent of external factors and the least commitment of resources.

It may be of interest that on St. John and St. Thomas in the U.S. Virgin Islands, where there is a high degree of development, the treatment system of choice for public sewage works currently under

design are aerated lagoons. The more complicated mechanical systems used in the past have operated poorly due, in part, to lack of maintenance and are now being abandoned.

Once the sewage has been treated to an acceptable level, such as tertiary treatment by the use of polishing ponds, it must be disposed of. Our strong recommendation is that some form of land disposal, i.e., irrigation of landscaped areas be practiced. This has a number of benefits:

1. Protection of nearshore coastal environment from nutrient enrichment and consequent degradation, and
2. Conservation of fresh water.

The protection of nearshore coastal environments is central to the long-term viability of the Peninsula as a first-class resort destination and attractive recreational facility for the domestic population. Consequently measures will need to be taken to ensure that acceptable water quality standards are maintained.

Although potable water is relatively inexpensive on St. Kitts at the present time, it should be noted that shortages of high quality water during the dry season already exists. An average yearly deficit of approximately 800,000 gallons is or will be made up with groundwater extraction (Rawlins, personal communication). Substantial public expenditures will be made shortly to supply water to the Peninsula. Cost estimates are on the order of EC \$10 million. To assist GSKN in recovering this expenditure in a shorter time frame, and to encourage water conservation, we recommend that water rates for heavy water users on the Peninsula be appropriately adjusted to realize three goals: the protection of the marine environment; the conservation of water; and the shortening of the payback period for Government's investment in water works on the Peninsula.

### E.3.2 Moderate Density Development

Much of the moderate density development is located on slope ranges of 20 to 35%. Conaree Hills soils are likewise located on these slopes. Although the soil cover is considerably thinner than in the Bird Rock loamy sand soil, it is usually thicker than the soil found on the very steep clay loam slopes of the Sir Timothy's type. The thinner soils, steeper slopes, higher visibility and increasing environmental risk and cost of providing road access to development sites requires that these areas be targeted for less intense development than the lower lying and less steep areas.

Sewage disposal can principally take two forms depending on the specific site conditions and the density of development -- either on-site disposal or a sewage collection network which transports the sewage to a treatment plant nearby.

On-site disposal will generally only be appropriate for relatively low-density residential development, such as house parcels. On the basis of the constraints set by slopes and soil cover (or depth to rock), one-quarter acre lots are the minimum recommended lot size for smaller houses, with one residential dwelling per lot. Soil percolation tests will be necessary to ensure that such a disposal method is appropriate for a particular site. Larger houses should have 1/3 to 1/2 acre lots.

For higher density developments (i.e., greater than one dwelling unit per 1/4 acre), sewage collection and treatment at a central facility will be necessary. The sewage treatment facility should be one of the systems listed under Table 4.1 from the EAR. The use of septic tanks and soakaways is not recommended for the same reasons presented earlier, i.e., the problem of disposing of large volumes of partially treated sewage.

Again, as in the high intensity development zones, we recommend sewage lagoon systems. They do, however, require more flat land than the more energy intensive, mechanical systems. The system of choice will largely be dictated by the available terrain.

The use of polishing ponds for effluent after discharge from the treatment works will ensure a high quality, non-objectionable effluent. This effluent, after chlorination, can readily be used for irrigation of landscaped grounds.

### E.3.3 Limited Use Areas

The land areas of the Peninsula having lands slopes in excess of 35% present serious constraints for development carried out in the usual manner of excavation and fill. Bedrock is generally directly underneath the thin surface soil. Most of the soil type found in such terrains is Sir Timothy's clay loam. The natural steep terrain makes any newly exposed slopes potentially unstable, unless costly retaining walls are used. The development of vehicular access roads, which are at best limited to gradients of 20%, are particularly disruptive to the terrain. Alteration in a watershed's hydrology and increased soil erosion are particularly damaging consequences of unregulated development practices in such terrain. Needless to say, attempts at sewage disposal using traditional methods is inappropriate and constitutes potential health hazards.

Sewage disposal in any manner on-site will pose serious problems. The collection by sewers and transport to a treatment facility will be necessary. The grouping of dwellings into a cluster will reduce the expanse (and environmental damage from construction) of running sewer intercept lines (as well as any other type utility such as water, telephone and electric services).

The use of septic tanks and drain fields for individual or detached dwellings should not be permitted under any circumstances. The shallow soil cover and steep slopes can result in exposed sewage seepage downslope. Alternative methods, such as composting toilets which do not use water carriage medium, are appropriate for such sites. Small treatment works which produce an effluent acceptable for irrigation may also be feasible; however, such systems are usually dependent on electric power which if it fails, will upset the treatment system.

#### E.3.4 Other Associated Commercial Uses

It is recommended in this report that any urban commercial development, including a marina, be clustered about White House Bay, the general location of the old salt works. Sewage from such facilities will largely be of the domestic type (except wastewater from the marina).

Such development should follow a master plan which includes the location of service facilities, i.e., electric, telephone, waste and sewage lines. During the early stages of development of this area, the individual businesses may be scattered and the use of septic tanks and soakaways may seem appropriate. However, we suggest that the utilities be installed from the outset by the "developer." It will avoid the additional cost of the septic/soakaway and tend to encourage more rapid development due to the availability of the utilities. The availability of a sewage collection system and treatment facility will also facilitate larger scale developments, such as the marina which will need sewage pump out service.

The placement of the sewage works will need consideration based on the demands of the system hydraulics. Gravity flow is generally preferable to pumped flow, due to the cost of pumps and their operation. The planning for the sewage systems should be an integral part of the master plan for the urban center to ensure that the most cost effective designs are not precluded by other development decisions. Such planning should include restrictions on the type of waste introduced into the system. Toxic wastes, salt water or other types of waste which would upset the system (or place restrictions on the disposal of effluent by irrigation) should not be allowed.

The final disposal of effluent will also need consideration in the planning stage. Until a sewage outfall is constructed, land disposal will need to be practiced. Sufficient land will need to be set aside, either in the form of landscaped areas or uses with an economic return, such as trees which can be harvested.

In summary, the urban centre development due to its relatively high density of development and the different types of possible, but yet unknown, uses will pose the most difficult planning task and should be approached with foresight and in a comprehensive fashion.

## APPENDIX F

### SOLID WASTE DISPOSAL

#### F.1 INTRODUCTION

The disposal method of solid waste (garbage, trash, etc.) depends to a large degree on its final fate, i.e., the recovery of usable end products or its disposal without any attempt to gain returns.

It does not appear that any resource recovery operation will be appropriate on the island of St. Kitts at this time. Resource recovery facilities are industrial processes requiring a large capital investment, skilled technical operators and both an adequate quantity of raw material and a demand for the finished product to be economically viable. The relatively low volume of solid waste produced on St. Kitts will make resource recovery economically questionable. By example, a form of resource recovery is practiced with the burning of the sugar cane bagasse to produce energy (heat) for the sugar mill operation. In this case, a large volume of waste is converted into a usable end product -- heat. The cane processing facility had been designed and constructed to utilize this waste product as a resource. Resource recovery of solid wastes might become viable at some future time, but certainly not until total daily waste exceeds 100 tons.

Another type of resource recovery is the practice of feeding swine on organic garbage, of which hotels produce a large volume. It has, however, been demonstrated that such practice is linked to trichinosis in swine which in turn can be transmitted to humans. Likewise, a viral disease of swine, vesicular exanthema, similar to foot-and-mouth disease, has been linked to feeding swine on raw garbage. To prevent such disease transmittal, garbage should be heat treated if it is to be recycled.

#### F.2 SANITARY LAND FILL OPTIONS

The current waste disposal practice on St. Kitts at Conaree is open dumping and burning. This practice, which not only is visually objectionable, also results in smoke, odors and encourages vectors, such as rats, mosquitoes, and roaches. We recommend that the practice of open dumping be replaced with a sanitary landfill.

The operation of a sanitary land fill needs to satisfy the following criteria:

- daily cover of the waste with earth
- no open burning of the waste material

- no deterioration of surface or ground water quality at the site.

The issue of concern is whether these three criteria can be satisfied on the Southeast Peninsula if a temporary or permanent sanitary landfill is located there.

1. Daily cover with earth appears possible as some of the shallow sloped coastal foothills appear to contain fairly deep soil deposits (this is based on the observation of two abandoned wells). The soil is the Bird Rock loamy sand. Its permeability (drainage through soil) is high and this feature is not desirable for cover material as a sanitary landfill where the exclusion of moisture from the buried trash cells is important. The compaction and burial of the solid waste precludes access to it by rats, flies mosquitoes breeding in ponded water, roaches, and so forth.

2. The prevention of open burning is controlled by the sanitary landfill operators by ensuring that waste is promptly compacted and covered with earth into a cell separate from the previously buried waste. Nevertheless, good operating practice calls for the availability of a fire fighting capability at the site, or in proximity. Presumably this could be effectively accomplished on the Peninsula.

3. The prevention of contamination of surface or groundwater (principally the latter on the Peninsula) is anticipated to be the most serious problem to which no apparent solution exists until the construction of a central sewage treatment facility with an ocean outfall. The buried solid waste, due to moisture present in the waste or introduction from other sources, will produce a very strong decomposition liquid leachate which will contaminate any recovery water.

At the SEP, groundwater pathways to either the salt ponds or the beaches and shorelines are rapid, both due to the short distances and the high soil permeability. Thus, if leachate is not collected from a sanitary landfill and sent to a sewage treatment plant, it could rapidly pollute and adversely affect any water body in proximity. The collection of leachate from a potential sanitary landfill on the SEP is possible. The usual procedure is to line the bottom of the landfill with an impermeable material such as compacted clay or a man-made material. The leachate is pumped to the surface. However, until a treatment plant is constructed on the Peninsula for the treatment of the leachate, the location of a sanitary landfill is not recommended.

It may be advisable to reserve a location for the future installation of a sanitary landfill when the volume of development necessitates a centralised sewage facility and ocean outfall. Such location could be inland of Sand Bank Bay.

### F.3 CONSTRUCTION WASTES

During the construction phase of the road and resort facilities, the need for solid waste disposal will also exist. We recommend a "temporary" site for such use only inland of Sand Bank Bay, where massive series of sand dunes are located. This area itself can serve as a source of construction sand. After portions of the dune are removed, solid waste can be deposited in the remaining depressions or holes. It is recommended that a site specific examination of soil, geology, terrain, and hydrology be carried out to ensure that the site is acceptable within the limits determined by those principal parameters. We further caution that no petroleum waste products be disposed of anywhere on the Peninsula. Instead provision should be made at the electric plant for use of this waste product as fuel for the generating plant.

In summary, we recommend that a temporary sanitary landfill be established on the Peninsula to serve only during the construction phase of the road and related facilities and development projects. When a centralised sewage treatment works are constructed on the Peninsula, then, and only then, a permanent sanitary landfill could be established. In the interim, solid waste from operations on the SEP should be trucked to Conaree, which preferably should be upgraded to a sanitary landfill.

## APPENDIX G

### CONTROLLING IMPACTS OF SPEARFISHING AND MARINE SPECIMEN COLLECTING ACTIVITIES

#### G.1 SPEARFISHING

##### G.1.1 Potential Impacts

Spearfishing selectively removes certain species from ecosystems, usually coral reefs where fishes are naturally abundant. In St. Kitts and Nevis, local spearfishing is primarily for recreational and personal consumption and makes little or no contribution to the artisanal or "commerical" catch. Spearfishing by tourists differs from the local activity in that the primary motivation is "pleasure of the hunt;" food acquisition is a minor objective or is of no consequence at all.

In both cases, fishing effort is primarily targeted toward larger species (groupers, snappers, jacks, triggerfish, parrotfish), but these species are known to become more wary and reclusive where spearfishing is common. As a result, increasing spearfishing activity usually means that other (often smaller) reef fishes will be included in the catch (Goodwin, personal observations in the Grenadine Islands). This is particularly true in the case of tourists for whom size or species of fish is a secondary consideration. Most spearfishing tourists shoot anything in sight!

In the 1950's, there was considerable controversy between sportdivers and anglers concerning the impact of spearfishing in Florida. Objective analysis of the problem (Murdock, 1957) indicated that the total quantity of fish taken with spearguns was much less than the catch of anglers and commercial fisherman, leading some to conclude that serious depletion by spearfishermen was unlikely. More recent research, however, has compared protected reefs with others on which spearfishing has been permitted for 30 years. These studies show that larger fishes, particularly snapper and grouper, are absent from reefs subjected to spearfishing but abundant in protected areas (J. Bohnsack, 1986, personal communication). It is not known whether spearfishing is correlated with depletion of the larger fishes, or displacement of these fishes to deeper waters; but if these fishes have been displaced from breeding or nursery areas (groupers for example are known to aggregate in particular areas for breeding), the long-term impacts of displacement may be as serious as direct depletion.

The indirect impacts of removing or displacing species of larger fish may be severe in coral reef systems. Large herbivores (such as parrotfish) control the growth of reef algae which can overgrow and kill corals in the absence of grazing. Coral diversity has been related to parrotfish grazing: where grazing is slight, the community tends to be dominated by algae. As the intensity of grazing increases, coral

diversity increases, but will decline under very heavy grazing (Brock, 1979).

Similarly, removal of large predatory fishes can result in the proliferation of smaller fishes with similar results. Damselfishes, for example, defend their territories against other grazers. Large numbers of damselfish favor the development of thick algal mats which interfere with coral growth and diversity, as well as cementation of reef material by coralline algae.

There is little question that spearfishing makes fish more wary and results in the apparent absence of larger fish species (Barada, 1974). Because of these effects, spearfishing interferes with other recreational activities such as snorkeling, SCUBA diving, or underwater photography which derive a large part of their appeal from the presence of visible and relatively tame fishes. In the U.S. Virgin Islands, such non-extractive activities account for a major portion of tourist-use of marine resources (Olsen and Wood, 1983). It seems likely that fewer tourists will engage in spearfishing than in snorkelling, diving, or other types of recreational fishing.

At present, local spearfishing probably has little adverse impact because of the small number of people engaged in this activity. Fisheries development consultants, however, have repeatedly concluded that nearshore fish resources are generally overexploited, and cannot support increased fishing effort. An increase in spearfishing in St. Kitts and Nevis, therefore would contribute directly to overfishing as well as resulting in the sorts of impacts described above. For these reasons, it is not desirable to stimulate any increase in spearfishing, e.g., through promotion as a tourist activity or through spearfishing competitions.

#### G.1.2 Suggested Controls

Spearfishing is a non-essential component of the local fishing industry. A substantial increase in spearfishing activity would deplete nearshore fishery resources and would deny the benefits of these resources to the general public in favor of a small fraction of the population (in this case, that fraction which actually engages in spearfishing). While it is not desirable to create the local appearance of excessive regulation, some control on spearfishing is clearly needed.

In other locales, six basic approaches have been used (Kenchington and Salvat, 1984):

- designation of certain areas for specific uses (zoning)
- closed seasons
- rotating closed areas to permit recovery
- setting "bag limits" on permissible levels of use
- prohibiting certain types of equipment
- establishing size limits for harvested species.

Because the St. Kitts and Nevis nearshore fisheries cannot support any increase in harvest, regulation should at least maintain the status quo. Direct control of local spearfishing activity is not recommended at this time, but may be necessary if this activity increases. The following regulatory actions are suggested:

1. Spearfishing should be prohibited in all marine protected areas. This prohibition should apply to residents and tourists alike.

2. Importation or use of spearguns by non-residents should be prohibited (i.e., tourists cannot spearfish).

3. Renting, using or promoting the use of spearguns for financial gain or reward should be prohibited. This restriction would apply, for example, to spearfishing competitions.

These regulations are intended to permit local spearfishing only at present levels and are designed to discourage spearfishing for sport or as a commercial enterprise.

Many countries the world over -- small and large, developed and less developed -- require a licence for any kind of fishing. Some even regulate the importation of spearguns like firearms, prohibiting their temporary importation by visitors (tourists) and requiring "resident" licences for local ownership and use. Others prohibit all spearfishing. What is needed in St. Kitts and Nevis, until such time as fish species management plans are in place, is a cautious, balanced approach responsive to the mounting evidence of "over-fishing" in the State's coastal waters.

For some, this raises the possible question of a double standard -- an unavoidable but necessary and defensible situation. This is justifiable on the grounds that:

- (a) local spearfishing is primarily for food (a subsistence enterprise) and is selective;
- (b) visitor (non-resident) spearfishing is primarily for sport, tends to be non-selective (as to size and species), and tends to occur in the same reef areas popular among visiting snorkelers, divers, and underwater photographers whose interests are served only by a non-extractive use of the resource;
- (c) the prohibition against visitor possession, rental and use of spearguns is a temporary management measure designed to protect the resource for all non-destructive users while guidelines are being developed based on more quantitative fish stock and yield data.

## G.2 COLLECTING

### G.2.1 Hard Corals

#### G.2.1.1 Potential Impacts

Hard corals (scleractinia) include species which are responsible for building coral reefs. These reefs are used by a wide variety of commercially important fishes for food, shelter, breeding and nursery areas. Coral reefs also act as breakwaters, dispersing ocean waves and currents which would otherwise cause severe coastal erosion; many beaches would not exist if coral reefs did not provide protection from the sea. The aesthetic appeal of reefs is well-known, and is important to some segments of the tourist industry.

Hard corals, particularly those in demand for souvenirs, have extremely slow growth rates; a "head" of brain coral requires at least fifteen years to reach a diameter of six inches. Because of slow growth rates, removal of hard corals generally cannot be compensated by natural processes. This can interfere directly with all of the reef functions described above. While limited harvest of the most rapidly growing species (e.g., staghorn or elkhorn corals [Acropora sp.]) may be possible, permissible harvest levels have not been established, and the critical breakwater function of these species demands a conservative approach to management (i.e., no harvest should be permitted until permissible levels are known).

#### G.2.1.2 Suggested Controls

Section 16 of the draft Fisheries Regulations for St. Kitts/Nevis prohibit collection of coral without permission of the Fisheries Officer and should provide adequate legal protection. However, it is also recommended that the Fisheries Advisory Committee establish a policy of denying permission for any hard coral harvest until formal management plans are developed for these species. Coral harvest should be prohibited in protected areas.

### G.2.2 Soft (Precious) Corals

#### G.2.2.1 Potential Impacts

Precious and semi-precious corals (e.g., black coral, rose coral) are valued as raw material for jewelry and art objects. None of the precious corals are reef building species, but have significant economic potentials: the value of the pink coral industry in Taiwan and Japan was about \$50 million in 1982; retail sales in Hawaii total almost \$20 million annually (Grigg, 1983). Caribbean precious corals are found in relatively shallow waters (in contrast to most Pacific species which must be harvested by submarine or tangle nets), and may provide significant foreign exchange income if properly managed.

These corals, however, are characteristically subject to overexploitation because of slow growth rates, lack of natural defenses, absence of management guidelines, and difficulty of enforcing management regulations.

#### G.2.2.2 Suggested Controls

The draft Fishery Regulations (Section 16) which prohibit collection of coral without permission of the Fisheries Officer provide adequate legal protection, but it is suggested that the Fisheries Advisory Committee establish a policy of denying permission for commercial soft coral harvest until formal management plans are developed for these species. Harvest of soft corals should be prohibited in protected areas.

### G.2.3 Ornamental Fishes, Shells, and Other Animals

#### G.2.3.1 Potential Impacts

A variety of small reef fishes, shelled mollusks, and echinoderms are collected in many areas for tourist or export trade. As is the case with all nearshore resources, stocks of these species are limited and may be overexploited relatively easily (the depletion of edible sea urchins and conch in many Eastern Caribbean islands are good examples of this). With the exception of some of the reef fishes discussed above, the ecological role of these species and their importance to humans are poorly understood. But the fact that these animals represent potential sources of income is sufficient justification for management. Promising operations to culture ornamental fishes have begun in the Bahamas, and this approach can probably be applied to selected mollusk and echinoderm species as well.

#### G.2.3.2 Suggested Controls

Adequate legal protection for ornamental fishes is provided by the draft Fishery Regulations (Section 17) which prohibit importation, sale, or export of aquarium fish without permission of the Fisheries Officer. Regulations are needed to prohibit sale or export of shelled mollusks other than conch and echinoderms without permission of the Fisheries Officer, and it is suggested that commercial harvest not be permitted until relevant management plans are developed. Collecting should be prohibited in protected areas.

## APPENDIX H

### SALT PONDS AND MARINAS

#### H.1 SALT PONDS

Sometimes viewed as a "nuisance," often used as dump sites, and generally unappreciated for the valuable environmental service they perform as sediment traps, salt ponds are nonetheless a valuable resource which occasionally can be developed for specialized purposes if handled carefully.

The following general rules should apply:

- (1) No ponds should be filled and no mangroves bordering ponds should be removed (except for a required, narrow marina entrance channel), especially as they serve as valuable avian habitats.
- (2) Friar's Bay Pond, Mosquito Bay Pond, and Great Salt Pond (see below) should not be considered for marinas.
- (3) Only one salt pond on the Peninsula should be opened up to the sea in any five year period to allow time to monitor the effects of any such opening on coastal water quality from increased sediments and turbidity.
- (4) Before any pond is "opened," an engineering study and Environmental Impact Assessment should be undertaken regarding (a) siting and design of the entrance from the sea, (b) dredging and disposal techniques and destination of dredge spoil, (c) marina flushing optimization, and (d) the biological impact of spoil discharge or deposition.

Recognizing the need for and value of a small marina, as a component of the Peninsula development strategy, we have examined the various proposed sites and concluded the following:

- (1) Great Salt Pond should not be modified in any substantial way but permitted to continue to serve as the sediment trap for the largest watershed on the Peninsula.
- (2) Great Salt Pond should not, therefore, be dredged or opened up for a marina.
- (3) Little Salt Pond is the preferred site for the Peninsula's first marina, although three possible sites are identified on the accompanying Land Use Maps and in Figure 3.3. The bund between Little and Great Salt Ponds should be elevated and widened slightly to strengthen it. In all probability, dredge spoil from Little Salt Pond

will not, however, be suitable for fill material as it is too fine with a high percentage of organic material.

We note that the Little Salt Pond is about one foot below sea level and Great Salt Pond three feet below sea level. Opening Little Salt Pond will result, through seawater percolation, in raising the average water level in the larger pond by a foot or more.

## H.2 MARINAS

We view the proposed Little Salt Pond Marina as primarily a water-sports centre, not necessarily a full-service marina (slipway, welding shops, sand blasting, etc.).

Several aspects of any proposed marina construction require further attention. First, the salt ponds have little protection from storm waves, and erosional scars on hillsides adjacent to the pond suggest that large waves have crossed the pond in the past. Such waves should be expected once every ten years and would have devastating effects on boats moored within the pond area. The fact that these waves often approach from the west makes the potential impact even more severe.

Secondly, it is by no means certain that a major marina is needed to attract yachting traffic to the Southeast Peninsula. Such traditional yachting stops as The Anchorage (Union Island), Petit St. Vincent Resort, Palm Island, and Young Island have only dinghy docks or very basic alongside facilities. Many cruising and charter yachts, in fact, prefer not to berth when on charter because of privacy, security, and aesthetic considerations.

Thirdly, berths and dock slips in the marina should be angled so that vessels are not broadside to prevailing winds, and great care needs to be exercised in the siting and design of any entrance channel cut through either Ballast or White House Bay beach. One only has to inspect the opening cut between South Frigate Bay and the adjacent salt pond to point up the consequences of careless siting and casual design (the former channel is now filled with sand).

Fourth, the feasibility of disposing of Little Salt Pond dredge spoil material in the center of Great Salt Pond to create a low wildlife island should be examined. The creation of a new avian wildlife habitat by this strategy would compensate for some habitat losses anticipated as a consequence of road construction around or along the perimeter of the Great Salt Pond. This technique has worked well in other tropical and sub-tropical areas (see U.S. Army, 1983).

## H.3 THE HURRICANE ANCHORAGE/SAFE HARBOUR CONCEPT

A safe harbour and full-service marina would be a logical component of improved harbour facilities near the Sugar Factory Pier in Basseterre

Bay. Access to industrial facilities, supply services, etc. would be considerably better, and the absorptive capacity for potential pollutants (inevitable in a marina) is much greater than on the Southeast Peninsula. A suitable breakwater structure could provide the protection desired and might also help alleviate present congestion near the existing roll on - roll off ramp and adjacent deepwater facility. This would have the advantage of diverting the polluting aspects of a full-service marina operation to a more appropriate site, leaving Little Salt Pond as a yachting and watersports centre (see also EAR, Sections 4.7 and 5.3).

## APPENDIX I

### MARKETING FACTORS

While it is quite possible that St. Kitts and Nevis can attract a significant number of new tourists and raise its occupancy rates for both existing and projected hotels by marketing the state as a "new destination" (as Anguilla has done successfully in the last five years), this approach has certain risks. At some point in time the new destination becomes an old one, and fickle tourists in search of an undiscovered place find another such allegedly unspoiled paradise, in the region or elsewhere. Therefore, it will be useful to have another arrow in the St. Kitts and Nevis marketing quiver -- one that emphasizes a longer term marketing strategy built around the unique characteristics of the country (and in this case of the Southeast Peninsula) as a preferred environment for a specialized kind of client group.

In the first place, the Peninsula is a remarkably undeveloped area with an outstanding collection of beaches and salt ponds, a relatively unspoiled natural environment with spectacular vistas and reasonably clear coastal waters. Furthermore the Southeast Peninsula presents a unique opportunity for the Federation of St. Kitts and Nevis to join in partnership with the SEP landowners to devise a cooperative and creative development strategy for the long-term.

There are those who would deplore the fact that the Peninsula is entirely privately owned and that Government does not possess developable land there. On the other hand, the presence of ten or twelve energetic and enterprising owners/developers is a given condition which can be viewed in a more positive light, i.e., as giving the country a significant competitive edge vis-a-vis the world market. With formidable energies and diverse talents, Peninsula landowners represent a marketing team core that, with a modicum of guidance and assistance, can collectively "make the Peninsula work" and attract the necessary external investment capital needed.

The challenge of the Southeast Peninsula lies, therefore, in the rather unique opportunity it provides the state to enter into a partnership with the private owners. That partnership could even extend to a mutual endorsement and implementation of a Southeast Peninsula National Park framework -- as an unusual cooperative marketing device and environmentally useful common resource management strategy. It could also induce GSKN to take a more aggressive and targeted marketing approach for the entire country.

A successful tourism marketing programme would involve three related tasks: (1) identifying product characteristics that distinguish the destination experience from its competitors, (2) selecting market segments most likely and willing to benefit from the experience, and (3) developing the most appropriate media strategy to effectively target these segments. The third task obviously demands the expertise of

marketing specialists. However, the unique natural features of the Southeast Peninsula easily suggest some general directions to guide policy makers in formulating approaches to the first two.

For example, the Peninsula presents a truly striking constellation of opportunities: compelling vistas of unbroken seascape, scenic views northwest to the capital city of Basseterre and southeast to the sister island of Nevis, the special ecology of two salt ponds, pristine white sand beaches, unusual arid terrain broken by rugged peaks overlooking dramatic coastlines, historical and archeological sites, unique wildlife habitats and nesting sites, relatively unexplored offshore reef areas, plus the promise of a variety of land activities and watersports that will develop over time.

Such amenities should appeal to a cluster of potential visitor segments. A few of the more obvious include: (1) the curious of all ages seeking different out-of-the-way destinations; (2) affluent older North American and Europeans looking for high quality vacations; (3) young outdoor-oriented professionals particularly in two earner families; (4) affluent and well-travelled West Indians; (5) and a variety of other relatively educated groups characterized by environmental awareness and specialty interests, e.g., amateur naturalists, professional scientists, dive clubs, wildlife associations and so on. In addition, such features should increasingly attract resident and emigrant returnee daytrippers curious about their natural heritage and/or a different recreational experience.

With respect to a media campaign, we suggest the Government participate closely with its media consultants in devising materials. This should include significant local comments on the product characteristics to be emphasised and the national image to be projected. It should also include involvement by a variety of tourist interest groups -- hoteliers, taxi drivers, tour operators, dive shops, airlines, etc. -- in the design of packages and day excursions that will exploit the scenic, environmental and recreational riches of the Southeast Peninsula and safeguard their long term viability.

One could begin with such routine items as:

- commissioning the writing of a natural history of the Southeast Peninsula
- developing a reference file collection of quality Peninsula colour photographs featuring flora, fauna, vistas, underwater scenes, beach recreation, diving, and sailing
- commissioning local artists to provide SEP paintings, sketches, drawings, woodcuts
- conducting familiarization tours

- mounting guided field trips/excursions to the Peninsula for existing groups of tourists and for local persons as well
- training guides for and scheduling hiking and boat excursions to the Peninsula.

It would also be instructive to examine the Anguilla experience since 1980. Tables I.1 and I.2 document the dramatic increase in tourist arrivals.

Table I.1. Tourist arrivals in Anguilla by air and by sea, 1980-1985.

	BY AIR	BY SEA	TOTAL
1980	4,421	3,743	8,164
1981	5,546	6,180	11,726
1982	6,361	11,181	17,542
1983	5,369	16,420	21,789
1984	6,107	24,675	30,782
1985	8,296	47,167	55,463

Note 1: 1980-85 air arrivals have increased by 87.7%.

Note 2: 1980-85 sea arrivals have increased by 1160% (yachts, ferries to St. Maarten, and small cruise ships).

Table I.2. Total tourist arrivals to Anguilla, 1980-85.

	1980	1981	1982	1983	1984	1985
January	620	857	1,845	1,332	2,350	4,259
February	724	1,042	1,628	1,937	3,043	5,296
March	725	1,079	1,840	2,340	3,298	5,002
April	654	768	1,559	1,977	2,554	4,524
May	559	736	1,457	1,706	2,015	7,303
June	781	713	1,136	1,470	1,991	3,597
July	876	1,048	758	2,005	2,309	4,623
August	1,069	1,619	2,243	2,436	4,326	6,297
Sept.	520	549	860	1,173	1,589	2,486
October	491	884	1,417	1,370	2,012	2,733
November	500	1,033	1,488	1,992	2,247	3,659
December	645	1,398	1,311	2,051	3,048	5,684
	<u>8,164</u>	<u>11,726</u>	<u>17,542</u>	<u>21,789</u>	<u>30,782</u>	<u>55,463</u>

Although certain aspects of Anguilla's development may not exactly parallel the Southeast Peninsula's potential because of the former's proximity to St. Maarten for day-tripper trade, etc., there are other valuable lessons. The Anguillian experience demonstrates how a favourable mix of key ingredients, similar to the Peninsula's assets, can be blended into a successful, integrated national tourism strategy for a "new destination." These components include, first, aggressive promotion with a very clear, well defined set of local characteristics, e.g., tastefully designed, low density, quality accommodations; a wide price mix; outstanding beach/reef amenities; and tranquil island charm. Secondly, it includes targeting a specific market segment -- the affluent, long-staying, up-scale North American and European-style visitor -- in a deliberate attempt to match the destination supply features with demand preferences. Finally, the overall policy includes a comprehensive legal, tax and environmental protection framework, e.g., tax concessions for the development or expansion of explicitly small hotels and guest houses, restrictions on outright purchase of land by foreigners, as well as the establishment of a marine reserve, new national park legislation, and an archaeological site protection and development programme. These three sets of factors have created a small-scale, favourable dollar return, high multiplier style of Anguilla tourism which deserves serious consideration by St. Kitts and Nevis officials and private Southeast Peninsula developers.

## APPENDIX J

### ENVIRONMENTAL IMPACT ASSESSMENT

#### J.1 THE EVOLUTION AND VALUE OF ENVIRONMENTAL IMPACT ASSESSMENT PROCEDURES

Environmental impact procedures were first developed on the North American continent in response to growing public concern over the unexpected and unwelcome environmental changes accompanying the construction of large-scale developments. Many of these projects were carried out by or for government agencies and did not require the approval of resource management and regulatory authorities. They had, therefore, not been subjected to an independent and comprehensive evaluation of associated environmental impacts. In recent years, both in North America and elsewhere, the use of environmental impact assessment procedures has also been strongly advocated for non-government development proposals.

The principal advantage of environmental assessment procedures is that they increase the scope of information available to decision-makers. In other words, the whole range of possible environmental impacts can be considered rather than just single factors such as soil erosion or water pollution. Moreover, the assessment of environmental impacts should begin from the inception of a project proposal and continue throughout the design stages. This permits the environmental impacts to be taken into account before resources are irrevocably committed. Environmental impact assessment does not however replace other regulatory mechanisms like building codes or zoning restrictions.

#### J.2 THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

Environmental impact assessment is a process by which a deliberate, interdisciplinary, systematic effort is made to assess the environmental consequences of choosing between the various options which may be open to a decision-maker. The aims of an assessment are:

- (a) to determine and evaluate the environmental impacts of a proposal to enable a choice to be made between various options;
- (b) to determine what measures should be taken to avoid or minimise damage to the environment by the development and implementation of a project proposal; and
- (c) to identify opportunities for achieving other desirable environmental, social and economic objectives by means of the development and implementation of the proposal.

To be effective, the assessment of environmental impacts must be integrated with the planning and design of proposals. It should begin when the proposal is little more than an idea and gradually refined as options are identified, analysed and choices made. It should continue throughout all the development stages up to and including implementation and monitoring. At each stage, the assessment should be orientated toward the decisions being made at that time.

### J.3 ENVIRONMENTAL IMPACT ASSESSMENT PROCEDURES

There are a variety of possible procedures because not all proposals produce the same level of impacts. A mental check may be all that is necessary for proposals with minor potential impacts. Other proposals, however, need to be more rigorously examined and require the gathering, analysis and documentation of information. It is necessary to establish a method to determine the significance of the potential impacts of a proposal and to select the appropriate procedure for the EIA.

The information available about the potential consequences of a proposed project is usually incomplete and the sources dispersed. Judgments about the kind and magnitude of impacts will therefore be based on a mixture of fact and opinion. Opinion is always biased by personal interests and viewpoints, and it is therefore desirable that proposals be examined from as wide a range of perspectives as possible. Procedures must not only provide for the collection, dissemination and review of information but also allow for the widest possible involvement of knowledgeable or interested people. A common means of doing this is to issue a public invitation for comments and submissions on published documents which provide information about the proposal and its implications.

The assessment of the environmental impacts of a proposal would be futile if the measures identified for alleviating impacts or for taking advantage of environmental enhancement opportunities are ignored in project or policy implementation phases. This situation is more likely to arise when responsibility for putting such measures into effect is left to the proponent. Therefore, to make environmental impact assessment an action-oriented process, proponents must be required to formally respond to recommendation and, if necessary, negotiate new, less damaging approaches. Six stages can be distinguished:

- (i) Initial evaluation of proposals to determine how rigorously they need to be assessed and the appropriate assessment procedure.
- (ii) Determination of the coverage of the assessment including the identification of the principal issues that need to be dealt with.
- (iii) Site studies, analysis and documentation
- (iv) Review

- (v) Approval/Disapproval
- (vi) Monitoring.

An explanation of each of these stages follows.

### J.3.1 Initial Evaluation

The scope of environmental impact assessment procedure undertaken for a particular proposal should depend on the anticipated significance of its environmental effects and on the degree of public interest shown.

In most countries, proposals are examined against a set of specified criteria. In its most basic form, the set of criteria may simply be a list of development types for which the preparation of an EIA is desirable. However, within these designated development types some proposals may be too small, on a site sufficiently resistant to impacts or do not raise enough public concern to warrant a detailed and formal EIA. A degree of flexibility in the application of criteria is therefore desirable.

An alternative approach is to provide a list of questions which the decision-maker is invited to consider for proposals "likely to have a significant effect on the human, physical or biological environment." No definition of "significant effect" is given, but a checklist of questions customarily asked is as follows:

- (a) Does the proposal transform a significant physical area?
- (b) Does the proposal affect existing communities or involve the establishment of new communities?
- (c) Is the proposal likely to have a long-term effect on the living conditions or quality of life of those living in the neighbourhood, or will it affect their use and enjoyment of the environment?
- (d) Is the proposal likely to have a significant impact on the ecosystems in the area?
- (e) Are any especially important plant or animal species likely to be affected?
- (f) Are scenic, recreational, scientific or conservation values likely to be affected?
- (g) Is the proposal, although not environmentally significant on its own, likely to stimulate further developments which would have significant environmental impact?
- (h) Does the proposal affect any areas or structures of historical or archaeological importance?

- (i) Is the proposal likely to stimulate substantial public interest?
- (j) Does the proposal create a significant demand on a resource which is, or is likely to become, in short supply?
- (k) Does the proposal create pollution problems?
- (l) Does the proposal alleviate or remove any environmental pollution problems?

Whichever approach is taken, the decision can be facilitated by the preparation of a written report which briefly describes the proposal and gives a preliminary opinion on its environmental and social implications. It may also include details of various approvals which may be required and of any government assistance (e.g., direct participation or financial grants) likely to be requested. This report would normally be prepared by the proponent in consultation with other parties and the public. When complete, the report would be forwarded to the decision-makers.

On receipt of the written report, the decision-making agency would circulate it to appropriate persons and organisations with a request for further information and comments. After the comments and information received are considered, the decision is made whether or not an EIA is required. Public notification of the decision usually follows.

### J.3.2 Determination of the Coverage

Once it has been decided to prepare an EIA, it is necessary to determine the actions, alternatives and impact which should be covered in the report. Environmental Impact Assessments need to be presented so that they capture the attention of the decision-makers. This will not be achieved by providing excessive environmental data irrelevant to the decision-making process.

Therefore, in addition to identifying significant environmental issues requiring study, it is necessary at this stage to eliminate or de-emphasize issues which are unimportant. These latter issues can be covered in the EIA by briefly stating why they will not have a significant effect. Where appropriate, reference can also be made to their coverage elsewhere, e.g. a previous EIA or in one that is proposed.

### J.3.3 Site Studies, Analysis and Documentation

An Environmental Impact Assessment is a document which describes the means and environmental consequences of meeting the objectives of a proposal. In an outline an EIA should comprise:

- (i) a statement of the objective or objectives the proposed action is designed to meet;
- (ii) a description of the options available to meet the objective(s);
- (iii) the reason why any particular option is favoured;
- (iv) a detailed description of the favoured option;
- (v) a description of the existing environment which is likely to be altered should the proposal be implemented;
- (vi) a prediction of the nature and magnitude of environmental effects (positive and negative) of the favoured option and a comparison of these with the effects of the other feasible options;
- (vii) an identification of social concerns;
- (viii) a statement of the relationship between the proposed activity which may be localised, short-term and exploitive in nature and the maintenance and enhancement of long-term productivity;
- (ix) a description of any irreversible and irretrievable commitments of resources which would be involved in the proposed action if implemented; and
- (x) a description of proposed monitoring and inspection procedures.

The time necessary for preparation of an EIA will largely depend on the background information already available but will range from one to twelve months depending on the type and scope of the project. Some information on the potential impacts of a proposal can often be obtained by drawing on the experience of similar projects elsewhere. However, the generation of site-specific information frequently requires more time if base-line studies are lacking. To make allowance for seasonal considerations such as weather patterns, wave and swell sea conditions, animal breeding cycles or migratory species, a minimum of 12 months is usually essential for base-line studies if no data already exists. It is important therefore that such studies be set up early in the project design process. If this is done, then the results can be integrated with the technical and economic evaluations and other feasibility studies which commonly require less time.

#### J.3.4 Review

Environmental Impact Assessments should be reviewed to check their relevance, completeness and objectivity. The review process should establish that all major environmental implications have been identified and evaluated and that various options to reduce impacts or to

take advantage of enhancement opportunities have been adequately studied.

The review should not only be seen as a check on the adequacy of the EIA, but equally valuable is the opportunity it provides for further refinement of the proposal itself. The degree of public participation and expertise employed by the reviewing agency often enables a development proposal to be placed in a wider context than was possible at the outset. As a consequence, previously unidentified impacts may be uncovered. More importantly, the review period is often the time when opportunities for environmental improvement are uncovered.

#### J.3.5 Approval/Disapproval

Formal written notice should be given with "conditions" attached as appropriate.

#### J.3.6 Monitoring

The government unit responsible for the impact assessment process must monitor compliance throughout the implementation stage of the project and have authority to issue "cease and desist" orders and be able to levy fines in the event of non-compliance.

## APPENDIX K

### BEACH AREA MANAGEMENT CONSIDERATIONS

#### K.1 BEACH CHARACTERISTICS AND EROSION PROBLEMS

The sand beaches of the Southeast Peninsula are a mixture of terrestrially-derived materials (quartz and several other minerals) and fragments of carbonate skeletons of marine organisms (corals, algae and mollusc shells). The proportions of terrestrial and marine components differ widely around beaches in the Peninsula. Those on the north shore, from Friar's Bay to Sand Bank Bay, contain much reef-derived coral material. In quieter waters, terrestrial material and non-reef, marine-derived algal sands predominate. Most beaches are slowly replenished by a sand supply from adjacent marine communities. While the rate of production of algal sediments is high, the rate at which fresh coral sediments are supplied to a beach is quite low. Generalizations cannot easily be made on the rate of supply of mineral sediments from land-based sources, but will rise as development on the Peninsula induces erosion and runoff which will increase terrestrial sediment inputs to coastal areas.

The algal sediments are extremely brittle and break easily at each joint. When exposed to weathering action, the particles break down into fine sand and silt sizes which tend to slump back into the sea. Therefore, the stability of algal beaches is very dependent on a continuous supply of fresh algal material which in turn is dependent on high coastal water quality.

All Peninsula beaches were classified in the previous Environmental Assessment Report (see Section 2.3.2 and Table 2.3). These beaches undergo natural cycles of erosion and redeposition. The cycles can easily be disturbed by headland erosion, by damaging associated coral reefs, by excessive sediments in coastal waters and by unconstrained beach sand mining. Marked, short-term beach retreat is more likely on leeward beaches of the Peninsula because of the greater range of variation and wave regime between the normal quiet conditions and the rare storm with winds, waves and swells out of the southwest.

Serious coastal erosion, the progressive loss of sand and sand beaches due to wave action, has been reported for St. Kitts since the late 1960's (Deane, *et al.* 1973; Cambers, 1985). Severe erosion on the Peninsula shoreline occurred during Hurricanes David (1979), Frederick (1979) and Klaus (1984) and continues at the present time in some areas. The most severely affected coastal areas are Banana and Cockleshell Bays, where large trees and shrubs are slumping onto the beach, and beach rock was found in October 1985. Ballast Bay has also changed significantly over time.

The specific causes for the widespread accelerated coastal erosion are not clear, but the important point to remember is that erosion is an

on-going natural process that can be accelerated by inadvertent human intervention, thereby raising the risk of either more serious short or long-term damage.

If the circumstances that have prevailed at Frigate Bay over the past ten years regarding the mining of beach and dune sand are any indication, this will be the most significant form of human interference in the case of the Southeast Peninsula beaches. Surreptitious beach and dune sand mining will undoubtedly be the largest single contributor to eventual beach erosion. The word "eventual" is important because on leeward coasts, although large quantities of sand are excavated during a period extending over 4, 5 or 6 years, as long as mild wave conditions are experienced, only slight localized recession of the beach is generally experienced. On these coasts severe recession may be experienced over a wide stretch of beach following heavy swells or hurricane attack. In effect, on leeward coasts the erosive effect of sand mining may pass unnoticed for several years -- perhaps as much as a decade. The rate of recovery of shell-coral beaches from sand mining is very low; consequently, losses tend to be semi-permanent. Developers are also cautioned against the indiscriminate alteration of the beach profile. Even though no sand is removed, if it is simply moved around to create a more aesthetic or a more functional beach slope, the net result may be the loss of sand from the beach. (See Deane, et al., 1973.)

It is extremely important that a surveillance strategy to guard against the removal of beach and dune sand be mounted and that violators be prosecuted early in the stages of Peninsula development so as to set an important precedent. The Peninsula simply cannot afford the casual disregard of the law and the potential negative impact of continued sand mining -- such as has been the case at Frigate Bay (see Towle, et al., 1985). A source of sand for construction uses can be selected from the rear or landward sides of the sand dune systems at North Friar's, Sand Bank, and Mosquito Bays. An Environmental Impact Assessment should be prepared to accompany any sand mining permit request.

## K.2 BEACH SETBACK CONCERNS AND VARIABLES

Setback guidelines for all structures built adjacent to SEP beaches are provided below, but actual building setback practices for back-beach areas should, in the main, be determined on a site-specific case-by-case basis by the project review permitting authority -- presumably the Planning Office and the proposed Environmental Planning Unit (EMU). It is difficult to establish a universally appropriate setback rule for all the Peninsula beaches because there are so many variables for any given bay and beach. Some key variables which need to be assessed for each and every prospective development site include the following:

1. Location, height, width, age, stability of existing sand berms and dune systems;
2. Presence, proximity, type, dimensions and density of adjacent coral reef "wave and swell barriers";
3. Extent, density, root depth and type of sand stabilizing strand vegetation on the dune or open area landward of the sandy beach and berms system;
4. Historical or physical evidence of beach accretion, erosion, stability;
5. Exposure (windward? leeward?) and wave/swell approach angles at different seasons of the year;
6. Beach profiles, bay configuration, and benthic nearshore geometry.
7. Beach sand composition (algal, coral, shell, mineral material)

Coastal setback guidelines are used by land use planners and architects not only to protect certain natural features of the area in back of the beach (as for example, displayed in Land Use Maps #1, 2, and 3 which accompany this plan), but also are used as a design factor to protect the facilities that are built behind the beach against the hazards and risks of storm flooding and wave damage in these low-lying backbeach areas. Therefore, in addition to the fixed setback guidelines (such as are provided in the Beach Control Ordinance) and those setback guidelines designed to protect specific environmental features, there is also a need to develop a separate setback rule for each beach on a customized basis. Much of the detailed information in the list of seven categories cited above is designed to be used for this purpose.

In addition, there are some other ways to get at a general rule of thumb for the setback guidelines for a particular beach with a given set of configurations. In Deane's 1973 study on Eastern Caribbean coastal erosion, he presented a recommended minimum zoning or setback table keyed to beach sand composition (see Table K.1). In the same document he also provided, in tabular form, probability estimates for the height of hurricane storm surges and maximum hurricane wave heights. Summaries of these data is presented in Tables K.2 and K.3.

An alternative, more conservative, approach was taken recently by an UNESCO consultant, Dr. Gillian Cambers, who, on the basis of extensive investigations in the state of St. Kitts and Nevis, recommends "a setback of 100m from the high-tide mark on ... lowland coasts."

To summarise, while the Beach Control Ordinance which involves a fifty yard setback is suitable as a general minimum rule, there are good

reasons to extend the setback line inland for various beach sites depending on the degree of protection desired and the risk factor as determined from existing information about the site. We hasten to note that the setback rule however arrived at only prohibits certain kinds of building and facilities in the high-risk zone and encourages cautious planning by way of a permitting process that requires the proponent or developer to justify the siting of any facility or building of any kind in this high-risk zone. For this reason, an Environmental Impact Assessment is essential because it forces the developer to explore all of the alternatives before arguing for the siting of a particular activity in the setback area.

Table K.1. Preliminary recommended setback regulations.

SEDIMENT TYPE (see below for key)	EXPOSURE	MINIMUM WIDTH LANDWARD of HWM (in feet)
A, A - m, A - sc	Windward, exposed	100
	Windward, protected	100
	Leeward, exposed	250
	Leeward, protected	150
A - M, A - SC, M - A, SC - A	Windward, exposed	100
	Windward, protected	100
	Leeward, exposed	200
	Leeward, protected	100
M - a, Sc - a, M, SC, M - SC, SC - M	Windward, exposed	60
	Windward, protected	60
	Leeward, exposed	150
	Leeward, protected	100

Note: These recommendations do not apply to beaches or coasts where active erosion, from natural causes, is being experienced or can be documented.

Key The classification of the beach sand is given by the "origin" method described as follows:

Algal Sand	A: 40 - 100%	a: 10 - 39%
Mineral Sand	M: 40 - 100%	m: 10 - 39%
Shell - Coral Sand	SC: 40 - 100%	sc: 10 - 39%

In all cases, the type of sand present in greater quantities is given first, e.g., M - SC indicates sand of mineral and shell composition, each greater than 40%, but with a higher percentage of mineral grains present.

Source: Adapted from Deane, et al., 1973 (Vol. 5, Table 2.3).

Table K.2. Probable hurricane surge heights on open coasts.

TIME EXCEEDED	ISLANDS	SURGE HEIGHT (ft)
Once in 5 years	Grenada to Anguilla (includes St. Kitts)	0.5
Once in 15-20 years	Dominica, Antigua, Barbuda, Montserrat, <u>St. Kitts</u> , Nevis, Anguilla	2.0

NB. Add Surge Height to MHW (Mean High Water) from Tide Tables, then add the appropriate wave height design figure from Table K.3 to calculate wave run-up and overwash.

Source: Adapted from Deane, et al., 1973 (Vol. 1, Table 3.3).

Table K.3. Design hurricane waves.

TIME EXCEEDED	ISLANDS	WAVE HEIGHT		WAVE PERIOD Ts (sec)
		Ho (ft)		
Once in 5 years	Grenada to Anguilla (includes St. Kitts)	10		7
Once in 20 years	Dominica, Antigua, Barbuda, Montserrat, <u>St. Kitts</u> , Nevis, Anguilla	25		11

NB. (1) The waves can approach the Peninsula coast from any seaward direction except N to NW.

(2) Add figure from this table to Hurricane Surge Height shown in Table K.2.

Source: Adapted from Deane, et al., 1973 (Vol. 1, Table 3.6).

## APPENDIX L

### THE "SOUTHEAST PENINSULA NATIONAL PARK" CONCEPT

#### L.1 YESTERDAY

From time to time, the idea of creating some kind of system of protected areas or even a national park on the Southeast Peninsula has surfaced. The 1981 ECNAMP survey of management alternatives for the SEP (see Jackson, 1981) outlined various low profile, mixed development options, including the establishment of a Southeast Peninsula National Park. It also noted that "... a national parks authority must be established by appropriate legislation ... [and that] ... a management plan for the National Park should be prepared detailing zoning considerations."

The accompanying plan (see Map 12 in Jackson, 1981) called for a wildlife zone of 400 acres split between Friar's Bay and Green Point and approximately 2,000 acres of a "protected landscape" zone (Nag's Head peninsula, St. Anthony's Hill and Salt Pond Hill, plus the western cliff areas from White House to Friar's Bays). It also suggested that all coastal shelf areas, except the one mile strip from Ballast to White House Bay, be designated a "coastal marine reserve." The remainder of the Peninsula -- perhaps a thousand acres -- was to be open to development, for tourism, agriculture, aquaculture, and low density residential housing.

As part of the ECNAMP investigation that preceded the report, the team conducted an interview survey of 150 persons at the Basseterre Market who, when asked about priorities for developing the Peninsula, ranked "national park" as the highest among six categories (agriculture was second). Obviously, it is neither a new idea nor one without some level of grassroots support.

In retrospect, the ECNAMP concept (and in fact the entire study) was useful but perhaps premature -- an idea that surfaced before its time. Maybe, however, the time has come to re-examine the prospects of treating some aspects of the proposed Peninsula road and development activity within a "park management" framework. Perhaps we should start with a quick look at what the concept "park" means in 1986.

#### L.2 TODAY

A park is nothing more than an enclosed parcel of land, small or large for which specific uses have been identified and for which specific management strategies are employed to ensure that the designated uses are facilitated and to minimize intrusions upon those uses. There are many types of parks.

1. Industrial parks which are established to attract investment and industry, often of a particular type. Industrial parks tend to emphasise the user's need for a guaranteed steady flow of specific kinds of services, i.e., water, power, transport, etc.

2. Theme parks which normally have an "entertainment" objective and are targeted to specific younger client groups requiring a recreational experience with "educational" trimmings. Disneyland, the Epcot Centre, and Busch Gardens in the United States as well as "marine-lands" and seaquariums are examples of theme parks.

3. Commercial parks which are customized shopping centres or freeport zones in a landscaped setting that is "park-like."

4. Natural parks which emphasise a particular landscape feature like the forested areas of Guadaloupe in the French West Indies or the Caroni Swamp in Trinidad (NB. some natural parks are also "national" parks).

5. Recreational parks such as Brewer's Bay or Magens Bay in St. Thomas, U.S. Virgin Islands, both of which are managed as public recreational areas but within a park setting. To a degree South Frigate Bay Beach is de facto a recreational park and will increasingly require management controls as such.

6. Historic parks which include special management strategies for areas like Brimstone Hill, the Christiansted Historic District in St. Croix, the Cabrits National Park in Dominica, or the Morne or Pigeon Island in St. Lucia. (Again some of these, but not all are national parks that are managed in the national interest by a central government.)

7. National parks, some of which are individual parks within a larger national park system such as the park on St. John in the U.S. Virgin Islands or the Morne Trois Piton Park in Dominica.

8. Parkways which are landscaped highways that are managed as linear "park" areas.

All of the above have one thing in common. All represent a demarcated area that has been set aside for special management purposes. Many have business-oriented implications. Most emphasise compatible land use, landscape enhancement, some protected and limited use classification, education, recreation and enjoyment. Some of them have characteristics within them that cut across sectoral definitions. For example, the Virgin Islands National Park on St. John has within it both historic components, e.g., the stabilized ruins at Annaberg and at Reef Bay, plus a functioning very popular, low-key campground run as a concession, a second privately operated campground located within park boundaries, plus one of the most successful high-priced hotels in the Caribbean region, the Caneel Bay Plantation surrounded entirely by the Park.

The point is that a park area can serve multiple use objectives which will, of course, affect the management strategies employed. The park framework serves as an ideal, well managed and customised setting for a set of compatible uses -- namely, a mix of specific kinds of tourism and recreational facilities and activities.

### L.3 TOMORROW

One could foresee the possibility of declaring the entire Peninsula a park (i.e., the Southeast Peninsula National Park) and then, within this framework, develop the site as a unique tourist attraction, allowing each landowner to proceed to develop his/her property as individually defined, whether for tourism, residential or other compatible purposes. The objective of the park would be to create a sustainable environment and support system for tourism, for recreational development, for maintenance of wildlife and natural features, and for the establishment of commercial enterprises such as marinas -- all designed to generate optimum revenues and encourage private sector business activity on a sustainable basis within the framework of an absolutely unique Eastern Caribbean setting. Why not a tourism complex operating under the "umbrella" of the Southeast Peninsula National Park? Imagine the value of this approach as a marketing tool. Every hotel would be (and could say that it is) located in a national park -- in a protected environment, in harmony with nature.

Park management and regulatory procedures would have to be established which did not infringe on or inhibit private sector development. Careful attention would have to be paid to protecting the amenities of the area, specifically its archeological and historical features and natural areas, quality of access roads, maintenance of clean beaches and recreational facilities. It would help to develop modest educational and research activities on the Peninsula that could function also as an oversight or quality control mechanism. It would even be conceivable to construct the township as a "Kittitian Village" or to consider restoring the mill (as Barbados and St. Croix have done) at the Fleming Estate.

The presence of the park and its management structure would guarantee quality maintenance of landscape features such as scenic vistas, roads, wildlife habitats, an unpolluted, unspoiled yet diverse and functional ecosystem. In effect, the St. Kitts and Nevis Government and the landowners could say that they had entered into a covenant or "pact with nature," that they had set aside an entire Peninsula (which is a unique land form in the Eastern Caribbean) for both tourism and public recreational opportunities. The emphasis would be on low-key, high-value human activity while maintaining a place of style with a superior quality control system.

## APPENDIX M

### GUIDELINES FOR EROSION AND SEDIMENT CONTROL

#### M.1 CONTROL PLANS

Erosion and Sediment Control (ESC) must be included as a primary development objective for Southeast Peninsula construction. If it is viewed as an add-on feature, to satisfy regulatory requirements, then it may be difficult to implement, more expensive overall and certainly not as effective as an integrated work item in normal construction procedures.

By its very nature, construction is a dynamic process. It alters the terrain, changes surface water flow patterns, removes vegetation and increases run-off. Thus, erosion/sediment control planning needs to be flexible and responsive to various types of conditions. In the development of an ESC plan, five basic, common-sense principles govern (EPA, 1976):

- (1) Plan the operation including the ESC plan to fit the topography, soils, waterways, and natural vegetation at the site.
- (2) Expose the smallest practical area of land for the shortest possible time.
- (3) Apply soil erosion control practices as a first line of defence against off-site damage.
- (4) Apply sediment control practices as a second line of defence against off-site damage.
- (5) Implement a thorough maintenance programme, during and after operations are completed.

##### M.1.1 Planning

The prior planning and integration of the ESC plan into the construction operation is essential for its effective functioning. The right measures need to be applied at the appropriate time. This does mean that the ESC plan needs to be understood, and regarded as important and necessary, by all parties involved, particularly the contractor who will implement the plan.

The planners/designers should have at their disposal relevant information regarding the site and its environment. This at the least should include (Porter, 1976):

- information about soils, geology and climatic conditions
- topographic information including contours that will adequately describe the area
- information about the drainage patterns on the site and on surrounding influencing areas; channel flow and conditions, ponds and streams (guts) should be included
- vegetative cover and conditions should be mapped and unique vegetative areas delineated
- location maps of the site relative to guts, trails or other prominent features.

For the Southeast Peninsula most of this information is available in current publications or reports (see Island Resources Foundation, 1986; Roughton, 1980 and 1981; Lashley, 1985, and Lang and Carroll, 1966).

Needless to say, one or more site visit by the design/planning team is essential to appreciate the opportunities and constraints of the site.

#### M.1.2 Minimizing Exposure

The second principle is to expose the smallest area of disturbed land for the shortest possible time. It is the most cost effective way to minimize erosion and sedimentation damages.

The phasing or scheduling of earth moving activities is crucial in this respect. The clearing and movement of earth from excessive areas at the development site ahead of the main construction activities is an unnecessary invitation to erosion and sediment trouble. Initial earth moving activities should proceed work only far enough ahead to prevent disruption of the overall schedule of activities.

Scheduling activities to allow for localized weather conditions will influence job progress and minimize the need for specific erosion/sediment control measures. Most, if not all, of the Eastern Caribbean islands experience the wettest part of the year and hence the greatest erosion risk, in the fall months (hurricane season) with a secondary wet season in the spring months of April and May. Planning of ESC measures with the weather factor in mind will greatly enhance the effectiveness of the effort.

#### M.1.3 Erosion Control

The third important ESC measure is to employ effective erosion control practices at areas that have been disturbed. It will minimize the production of sediment and hence reduce the cost to maintain the sediment control measures. Control does not begin with the perimeter sediment basin but rather at the source of the sediment and extends down to the basin. Erosion control should be in place as soon as possible to limit the exposure risk.

Erosion control has two principal features: 1) the shielding of exposed earth from raindrops impact and 2) the control of run-off which in itself is an erosion force.

Shielding of exposed areas can be accomplished through revegetation and/or the application of one of a number of surface materials which break the impact of raindrops. Materials locally available should be explored; bagasse, a sugar cane plant by-product, could be suitable when available.

The control of storm run-off is exceedingly important. If it is not properly dealt with, it can easily destroy and render useless all other measures. This becomes even more crucial in areas of steep terrain where run-off rapidly collects and builds up high erosive velocities. Not only can extensive damage be done to partially completed works, but as construction efforts proceed, it alters the terrain and drainage characteristics.

EPA (1976), Porter (1976), TRB No. 221, (1980), TRB No. 70 (1980) provide specific technical details regarding application of erosion control measures. Review of those and/or other publications is recommended for the preparation of ESC plans for the Southeast Peninsula.

#### M.1.4 Sediment Control

A second line of defence is provided by sediment control. Invariably some erosion will occur and the materials transported with storm run-off. Sediment control is aimed at prevention of the transport of detached soil portions from leaving the site and causing damage in the receiving waters or lower lying lands.

Sediment control is essentially the slowing down of run-off so that the sediment load will settle out. Coarser particles will readily settle out whereas fine clay particles may take exceedingly long. The latter can usually not be settled out as the size settling basin required becomes impractical. However, if a comprehensive erosion and sediment control programme is in effect, then the finer clay particles have a negligible effect, except in some special cases.

A number of specific sediment controls are available and details found in the above referenced literature.

#### M.1.5 Maintenance and Follow Up

All erosion and sediment control practices require routine inspection, repair and maintenance until their function is fulfilled. When problems are discovered, remedial action needs to be taken expeditiously.

Particular attention needs to be given to water handling structures (such as diversions, sediment traps, grade control structures, and sediment basins) and areas being revegetated. Sediment basins must be cleaned out when their remaining volume becomes ineffective in removing sediment. Removed sediment must be disposed of in a manner that it does not create new sediment problems. Its disposal method needs to be clearly spelled out in the ESC plan.

Upon completion of construction activities, all areas need to be stable and no further erosion and sediment transport active.

## M.2 SUMMARY

The five basic principles briefly discussed above provide a broad overview of an erosion and sediment control plan for construction operations. It provides the basic key elements which an ESC plan should provide. The plan in order to be adequately understood by the various parties involved should contain both a written description and clear and detailed drawings (see "information checklist" provided as Table M.1).

Table M.1. Information checklist for an erosion and sediment control plan.

## BACKGROUND INFORMATION

## 1. General:

Location of project  
 Extent of area to be affected  
 (directly and indirectly)  
 Type of construction operation

## 2. Site inventory:

Topography  
 Geologic analysis  
 Soil analysis  
 Climatic analysis  
 Hydrologic analysis  
 Vegetative analysis  
 Land use analysis  
 Critical areas

## SCHEDULE OF ACTIVITIES

Site Preparation

## 1. Access roads and staging areas:

Plan view (location)  
 Typical cross section  
 Profiles  
 Maintenance requirements and schedule

## 2. Drainage and sediment control structures:

Plan view (location)  
 Typical cross sections  
 Details (where needed)  
 Design computations (where needed)  
 Maintenance requirements and schedule  
 Adaptation to changing site conditions

## 3. Clearing and grubbing:

Plan views of limits of areas to be cleared  
 Description of procedure  
 Machinery to be used  
 Method of disposing of timber, brush and waste materials  
 Identification of critical areas requiring temporary stabilization  
 Phasing plan for clearing

Construction Operations

## 1. Scalping:

Methods of scalping topsoil material  
 Equipment to be used  
 Plan view of topsoil storage areas  
 Temporary vegetative stabilization of stockpile areas, or other methods to be used

## 2. Excavation/Fill and Construction:

Method of spoil handling  
 Plan view of spoil storage areas  
 Stormwater handling in spoil storage areas  
 Temporary stabilization measures  
 Permanent stabilization measures  
 Final disposition excess spoil materials

Reclamation Operations

## 1. Handling of toxic materials (if any):

Method of handling toxic material  
 Equipment to be used

## 2. Spoil rehandling and grading:

Typical cross section of regrading  
 Equipment to be used  
 Method of spreading topsoil or upper horizon material on the regraded area, including approximate thickness of the final surfacing material  
 Method of drainage control for the final regraded area

## 3. Revegetation:

Method to be used  
 Surface preparation  
 Critical area priorities  
 Nursery requirements  
 Fertilizer application (method and rate)  
 Mulch application (method and rate)  
 Maintenance requirements and schedule

## APPENDIX N

### PENINSULA TRAIL SYSTEM

#### N.1 HIKING TRAILS

Hiking and walking trails are a practical and effective means of increasing the tourist appeal of a destination by broadening its marketable product, i.e., expanding the opportunities for visitor relaxation, enjoyment, education, and self-directed activity with little capital cost and substantial help from "Mother Nature" who provides the scenery and wildlife. The thoughtful development of a Southeast Peninsula trails system has the double advantage of also providing a needed recreational and educational service to the local community.

A trail system is in a sense the exact opposite of a hotel facility because it involves active tourist participation and absentee management -- and is popular with many tourists for this very reason. It is a private affair, a change of pace, a unique local experience for the non-sedentary visitor escaping from urban stress, high technology, crowds and noise.

Establishing an effective hiking trail system is not a simple matter of cutting a bit of scrub with a bush crew and cutlasses. Trails should link attractions and unique features generally not otherwise accessible (e.g., peaks, scenic overlooks, isolated pocket beaches, special floral and faunal areas), and this requires a "trail plan." Easements need to be negotiated. Slope needs to be considered in order to rank trails as to their degree of difficulty; mileage between intersections must be measured and posted along with proper direction markers. A handout map and interpretive (educational) brochure (with rules) should be prepared and printed, first aid stations identified and stocked, and interpretive markers or signs prepared and erected at archaeological or historical sites. Provisions need to be made for trail maintenance, for waste containers and pick-up at marked locations, and for camping areas (if camping is one of the planned uses).

St. John (U.S. Virgin Islands), Montserrat and Dominica each has developed a popular hiking trail system linking park areas -- with rain shelters, graded trails and even guided "hikes" run by a naturalist/forester. On St. John, the trail system covers virtually the entire island, crossing but not using any paved roads. All trails are marked at each intersection, starting point and road crossing point. They are extremely popular and heavily used. A Southeast Peninsula hiking trail system should have high priority as an amenity organised by Government (the project could begin immediately). A local hiking club, youth group or other athletically or nature-oriented organisations could probably be enlisted to assist with trail system planning, construction and maintenance -- an activity which should be included in any SEP Environmental Education Programme.

## N.2 HORSEBACK RIDING TRAILS

Design criteria for a riding trail system differ considerably from those outlined above for hiking paths. A riding trail system lends itself to both commercial development and private sector management, requires flatter terrain and a wider graded dirt or gravel path, ideally without protruding rocks or tree roots, and is likely to be more dedicated to tourist use, if only because renting a horse and saddle by the hour can be expensive.

The right-of-way easement problem is very much the same and must be dealt with through a planning and negotiation process with affected landowners. It is possible that a right-of-transit easement with an unsepecified routing might be preferred by owners who have not yet settled on a site development plan and would be reluctant to commit themselves to a precise riding trail route across their property at this time -- even when they see the value of doing so.

If no one is charged with responsibility for developing the horseback riding trail system on the Peninsula, it will not happen; and the result will be an unsatisfactory practice of riders using feeder and access roads and the flatter stretches of some hiking trails and even beach areas -- all undesirable eventualities and often in conflict with vehicular traffic.