
Economic Opportunities Associated with the Environment in the Member States of the Organisation of Eastern Caribbean States (OECS)

Policy Paper

H. Jack Ruitenbeek and Cynthia Cartier*

OECS – Natural Resource Management Unit (NRMU)
Castries, St Lucia

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The authors may be contacted at:

HJ Ruitenbeek Resource Consulting Limited

RR#2 – Site 52, C21; Gabriola B.C., CANADA V0R 1X0

Tel +1 250 2478436; Fax +1 250 2478492; E-mail <hjr@island.net> or <ccartier@island.net>.

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Executive Summary

Background and Purpose. The Member and Associate Member States of the Organisation of Eastern Caribbean States (OECS) are comprised of small islands whose economies are both narrowly focussed and highly sensitive to environmental quality. Their economies and their natural resources are among the most vulnerable in the world, with shocks to any single economic sector or environmental asset being felt throughout the entire economic and social fabric. Traditional natural resource extraction activities (which represent about 6% of Gross Domestic Product [GDP]) as well as newer activities (such as tourism which represents about 43% of GDP) depend on a robust environmental quality if their contributions to the economy are to be sustained and optimised. A high level of environmental quality is thus an important contributor to achieving increased quality of life in both urban and rural areas. Protection of the environment and implementation of environmental initiatives contribute to economic growth and the creation of jobs, while at the same time degradation of the environment places constraints on economic development.

Managing these resources optimally in a small island context is a substantial challenge. Lessons from elsewhere suggest that appropriate combinations of regulatory and market based approaches can contribute to sustainable management. In addition, it is also clear from elsewhere that *all* such approaches rely on institutional structures that are resilient, are appropriately structured and financed, and have adequate adaptive management mechanisms to respond to a variety of changes ranging from persistent local change (such as water quality degradation or over-fishing impacts), to persistent global change (such as sea level rise), to short term-sporadic shocks (such as toxic spills or hurricanes.) This paper seeks to identify appropriate policy directions within a context of Island Systems Management (ISM) that embraces the principles of adaptation and precaution.

This paper was prepared under an initiative spear-headed by the OECS-NRMU. A central objective of the OECS-NRMU is to work with OECS Member States to support national natural resource management initiatives and to achieve enhanced environmental capacity at the national level. Several international agencies have partnered – and continue to partner – with OECS-NRMU in pursuit of these objectives; the CIDA sponsored Environmental Capacity Development (ENCAPD) project is one such initiative. Within ENCAPD, the preparation of this document is seen to provide OECS-NRMU and OECS Member States with a basis for pragmatic action to build economic policy in support of sustainable natural resource and environmental management.

Current Situation. Within OECS Member States, workshops conducted for this study suggested a number of priority sectors and areas, including watershed management, tourism development, waste management, and general renewable resource management and sustainability. Key institutional issues identified by local stakeholders included information availability, fiscal decentralisation, human resources and planning capacity, and the use of voluntary mechanisms within the private sector to achieve environmental quality goals.

Experience with environmental initiatives in the OECS is fairly limited to date, but it illustrates the important connections between environmental quality and economic development. A survey of existing revenue, expenditure and other measures identified a number of such initiatives in use in some OECS Member States. Environmental levies are imposed in the form of waste charges on tourists and others, and resource taxation is imposed in the forestry and fishery sectors; protected area fees are also becoming more common. Expenditures related to environmental problems have received greatest attention, such as the \$250 million in recent storm damage suffered by St. Lucia.

But in general the current situation underlines the following:

- There is very limited experience with revenue mechanisms, experience that does exist is tied to revenue objectives (as opposed to addressing incentive effects) and is focused primarily on waste

- *Case V.* Implementation of solid waste management services on St. Vincent is expected to generate almost \$20 million annually in health benefits. Cost analyses suggest that ample scope exists for diversifying waste recovery tariffs, but that the effectiveness will to a large degree depend on public awareness of the connections between environmental quality and human health.
- *Case VI.* Natural resources such as fisheries and forestry suffer in many OECS Member States because of under-pricing and inadequate rent capture by their managing authorities. Most strict regulatory measures have failed and scope exists to introduce economic policy measures such as use fees in forestry and individual tradable quotas (ITQs) in fisheries.

More generally, as a whole, the case studies illustrate that:

- Impacts will occur in more than one economic sector or activity and will moreover be manifest in multiple environmental goods or services. This again underlines the need for addressing such interventions in an integrated framework such as Island Systems Management.
- The economic impacts of policy interventions are likely to have both a revenue impact and an incentive effect. This indicates that policies intended to support sustainable behaviour will also have a non-neutral impact on revenues; such revenues can be used in a variety of ways: institutional strengthening, provision of services, or revenue shifting in a manner that other revenue generating mechanisms receive less emphasis.
- The use of earmarked revenues provides an important focal point for decentralising decision-making authority and provides greater incentives to local resource users to manage resources sustainably. It also provides necessary funding for capacity development. Potential often exists to generate revenues in addition to those needed for management of a specific resource; such revenues can accrue to central government funds or to management of other resources or services.
- Correcting current pricing distortions can lead to improved management of resources. This is particularly true where rents are currently not being realised.
- Economic policy interventions can be designed as “precautionary” instruments within an adaptive management framework. Many permit greater flexibility than would strict regulatory mechanisms.

Benefits of Action. A broad monetary assessment was undertaken of the economic benefits associated with policy reforms that protect key environmental resources. The analysis does not presume specific reforms; it simply reflects the fact that, in the absence of effective reforms, general environmental degradation will persist in a manner that threatens key economic sectors. Correcting such environmental degradation is typically more costly than preventing it in the first place. To this extent, the benefits of action may also be seen as the costs of inaction: “What would be the impacts of not pursuing appropriate policy interventions?” Table E1 thus illustrates that the benefits of implementing proper environmental management within OECS Member States is of the order of \$1,614 million annually. This represents approximately 25% of the collective GNP (\$6.55 billion/year) of the OECS. It should be noted that just over \$1 billion of these benefits are associated with potential

Table E1
Estimated Benefits of Maintaining Environmental Quality in OECS Member States

Sector	Benefits (EC\$ /year)
Renewable Resource Value - Forestry	\$ 8 million
Renewable Resource Value - Fishery	36 million
Biodiversity Values - Terrestrial	245 million
Biodiversity Values - Coastal and Marine*	793 million
Beach and Near-shore land values	187 million
Sustainable Tourism	214 million
Human Health	<u>131 million</u>
Total of Items Enumerated	\$ 1,614 million

* This component includes only mangroves and those marine areas currently inside Marine Protected Areas. Open ocean within the Exclusive Economic Zone (EEZ) is excluded.

biodiversity values, many of which currently can not be captured. Nonetheless, the other values (renewable resources, beach values, sustainable tourism, and human health) constitute readily realised benefits of \$576 million (8.8% of GNP).

Implementation Risks. Two significant issues are identified as critical to the successful implementation of any policy option: (i) general institutional capacity; and, (ii) policy harmonisation. First, *institutional strengthening is a co-requisite* to the successful implementation of any policy intervention; such capacity development should go hand-in-hand with the implementation process so that revenues generated through implementation can concurrently fund capacity development. Second, the concept of *policy harmonisation* (among OECS Member States) needs to be interpreted at a very general level that is supportive of reforms to introduce an economic dimension to environmental management. If it is interpreted in a stricter sense that requires harmonisation of specific policy instruments (e.g., levies, charges, etc.), such an interpretation may in fact be counterproductive in that it stands in the way of specific adaptive management requirements that may need to be pursued in different countries or, indeed, in different geographical areas within countries. In following such an interpretation, policy-makers must be aware that experience elsewhere demonstrates that, in many cases, the lack of harmonisation of environmental policy does not, in fact, create economic distortions

Policy Recommendations. The recommendations documented here should be seen as ones that guide general policy directions, rather than specific policies. The level of analysis undertaken to date has been for the region as a whole, with specific reference to some OECS Member States. Individual countries will need to build on them to fit local conditions and priorities. It is recommended that three over-arching strategies be adopted to guide environmental/economic policy setting in Member States of the OECS. The strategies and their associated objectives are:

- **Resource Pricing Strategy.** Many environmental goods and services are currently un-priced or under-priced. This results in perverse incentives that lead to resource mismanagement. Sand-mining, over-fishing, deforestation, and over-exploitation of biodiversity are all consequences of improper resource pricing. The under-pricing of such goods and services in effect constitutes an implicit subsidy by Government to resource users. The commitment under this strategy would be to systematically remove such hidden subsidies by seeking to introduce mechanisms and instruments (including regulatory or market-based instruments) that send proper price signals to resource users. Simply stated, the objective is to “get the prices right” for natural resources and environmental goods and services.
- **Revenue Earmarking Strategy.** The revenues that are currently generated by existing and proposed environmental levies or taxes often end up in central coffers and are not redirected or re-invested in maintaining the critical environmental goods or services that generated such revenues in the first place. The commitment under this strategy would be to systematically reorient revenue streams to make them available for financing supportive and related environmental initiatives. Simply stated, the objective is to “improve effectiveness of expenditures through targeting revenues and funds to specific environmental initiatives.”
- **Institutional Strengthening Strategy.** A clear lesson from elsewhere and from within OECS Member States is that environmental/economic policies and instruments can not be implemented in an institutional vacuum. The commitment under this strategy, therefore, is to provide support in principle and in substance to institutional strengthening and capacity development in the area of environmental/economic policy design and implementation. The commitment specifically recognises that such strengthening and development is a *co-requisite* (as opposed to a prerequisite or an outcome) of policy design and implementation. Simply stated, the objective is to “develop adaptive

decentralised sustainable institutions – in a ‘learning through doing’ context – that can assist in realising broader economic and environmental objectives.”

To complement the above general strategic directions, the report elaborates on additional policy support in the following areas:

- *General pricing and ear-marking strategies* should be implemented on the basis of country priorities elaborated through initiatives such as National Environmental Management Strategies, Integrated Development Plans, or similar national planning exercises.
- *Specific policy instruments* will likely focus on traditional charges and fee structures as a basis for policy support. Some of these will potentially generate revenue surplus to local resource management needs; any such surplus can accrue to central consolidated funds. In addition, the report encourages explicit policy support for three other types of instruments that might otherwise be neglected. All of these instruments have seen some usage in OECS Member States in different contexts, and all are primarily “revenue-neutral” schemes from the perspective of implementing States. These include: (i) voluntary schemes; (ii) recycling and deposit/refund initiatives; and, (iii) performance bonds.
- *General institutional strengthening and capacity development* should support: (i) fiscal decentralisation; (ii) adoption of precautionary and adaptive management approaches; and, (iii) public education and awareness building.
- *Specific institutional support* should be directed to the following: (i) policy support for watershed and coastal zone management; (ii) developing information and green accounting systems consistent with United Nations Statistical Office guidelines; (iii) expanded support for the role of protected areas in biodiversity management; and, (iv) initiation of programs related to green budget reform within central economic planning and finance authorities.

Near-term Steps. The recommendations provided above pertain primarily at a general level to any and all Member States of the OECS. Specific recommendations– such as those associated with the adoption of the three over-arching strategies – can be an immediate policy. But it should be recognised that much of the work involved with some of the specific policy and instrument identification and implementation tasks still needs to be done, and this is best done at a country level. To achieve this, it is recommended that the “next steps” focus to a large degree on work done by and in each individual Member State. To that end, the following represent the minimum near-term steps that need to be taken within each country: (i) general endorsement of policy recommendations enumerated above, with an emphasis on the three over-arching strategies; (ii) designation of a central responsible authority within each Member State, responsible for overseeing and monitoring progress related to the implementation of “environmental/economic policy initiatives” – this should be the Ministry of Finance, the Treasury, or a Central Planning Agency or Department; (iii) under the guidance of this responsible authority, a full inventory should be made of all environmental initiatives within the country; (iv) under the guidance of the responsible authority, identification of priority environmental/economic initiatives, along with potential for tax shifting – this will be informed by the above inventory as well as any national planning initiatives that set environmental and related priorities; and, (v) a separate initiative can be launched that provides explicit facilitative support to voluntary certification programs for private sector associations.

1. Introduction

Background

The Member and Associate Member States of the Organisation of Eastern Caribbean States (OECS)¹ are comprised of small islands whose economies are both narrowly focussed and highly sensitive to environmental quality. Traditional activities (such as fishing and agriculture) as well as newer activities (such as ecotourism) depend on a robust environmental quality if their contributions to the economy are to be sustained and optimised. High levels of environmental quality are also an important contributor to achieving increased quality of life in both urban and rural areas. Notwithstanding its importance to economic development throughout the sub-region, environmental quality issues have traditionally not received high priority in economic development decision making. Nonetheless, concepts of “sustainable development” have been articulated over the past decade and a growing environmental awareness has resulted in new understandings concerning the environmental implications of development. It has now become apparent, however, that “the environment” does not simply provide a background against which development takes place, but may play a substantive and direct role in such development: protection of the environment and implementation of environmental initiatives contribute to economic growth and the creation of jobs, while at the same time degradation of the environment places constraints on economic development.

A central objective of the OECS-NRMU is to work with OECS Member States to support national natural resource management initiatives and to achieve enhanced environmental capacity at the national level. Several international agencies have partnered – and continue to partner – with OECS-NRMU in pursuit of these objectives; the CIDA sponsored Environmental Capacity Development (ENCAPD) is one such initiative. Within ENCAPD, the preparation of this document is seen to provide OECS-NRMU and OECS Member States with a basis for pragmatic action to build economic policy in support of sustainable natural resource and environmental management. In addition, it complements efforts to implement the “Provisional St. George’s Declaration of Principles for Environmental Sustainability in the OECS,” (OECS 2000) which intends to “Use Economic Instruments for Sustainable Environmental Management” as a key guiding principle (Box 1). Within this context, this paper also assists in establishing a practical agenda for policy reform that can provide input to various countries’ planning processes.

To a significant degree, this policy paper is also informed and guided by lessons from elsewhere. While there is some experience within OECS Member States regarding the social and economic consequences of environment/economy interactions, the experience with policy development in this arena is limited. Within this context, some lessons from elsewhere are particularly relevant. First, the policy recommendations in this document acknowledge the strong co-dependence between economic and environmental (biophysical) systems, including potential human health impacts. Second, the policy recommendations acknowledge that neither strict regulations nor unfettered market incentives are likely to be adequate on their own as policy tools; there is a strong complementary role of regulatory and market forces. Third, the pre-condition of adequate

¹ The Member States and Associate Member States of the OECS include Anguilla, Antigua and Barbuda, British Virgin Islands, Dominica, Grenada, Montserrat, St. Kitts and Nevis, St. Lucia and St. Vincent and the Grenadines.

Box 1**The Economy, the Environment, and the Use of Economic Instruments in the Eastern Caribbean**

After an extensive consultative process, OECS Member States adopted the “Provisional St. George’s Declaration of Principles for Environmental Sustainability in the OECS” in November 2000. The document enumerates a number of principles of sustainable development by which all human conduct affecting the Environment is to be guided and judged. Principle 6 explicitly acknowledges some of the constructive policy linkages that can be drawn between economic issues and environmental quality.

Principle 6 – Use Economic Instruments for Sustainable Environmental Management

Each Member State agrees to:

- (a) Pursue and promote sound environmental practices, in part through the establishment of innovative means of generating public and private financial resources by means of fiscal incentives and market based instruments, and the reallocation and efficient use of resources;
- (b) Provide economic incentives to encourage the adoption of sound environmental technologies and practices;
- (c) Ensure that where pollution occurs the polluter shall be accountable and shall bear the expenses mandated by law and/or duly established authorities to return the environment to a generally acceptable state;
- (d) Adopt measures, following an incident which causes pollution of natural resources or harm to human health, to recover as expeditiously as possible from the legal or natural person responsible for the incident, all expenses incurred in the controlling, managing or the mitigating of the said pollution;
- (e) Develop and implement improved modelling, forecasting and monitoring techniques so as to provide comparative, quantitative and other information on environmental consequences of alternative policy actions, and their concomitant economic effects;
- (f) Agree at the regional and international level, on the use of environmental policy instruments to address regional or global environmental problems, and safeguard sustainable development;
- (g) Develop and apply methodologies for the economic assessment and accounting of natural resources and the environmental services they provide.

Source: OECS (2000).

institutional strength to implement any system of environmental management is acknowledged; this institutional support often requires significant efforts in management capacity development. Fourth, adaptive management structures that emphasise decentralised decision-making, and decentralised fiscal authority, provide effective mechanisms for managing local natural and environmental resources. Finally, there is an ongoing need for localised priority setting that focuses on trans-sectoral issues such as watershed management and integrated coastal management.

Specific Objectives and Approach

The objective of this policy paper is broadly to identify, within the context of the OECS Member States: (i) the potential for environmental initiatives to contribute to economic development; and (ii) the policy measures, including related economic instruments, available to government to optimise the contribution of environmental initiatives to economic development. In broad terms, the policy paper also identifies the economic consequences of failure to maintain an acceptable environmental quality.

For the purpose of this paper, the term “environmental initiatives” is taken to mean any activity or intervention that has as its objective:

1. The conservation or preservation of natural resources and/or environmental quality;
2. The creation of economic benefit from the sustainable use of the environment;
3. The protection of the environment from used, waste or spilled materials; or
4. The use of the environment for its amenity value.

Economic policy measures are also regarded as environmental initiatives, to the extent that they intend directly or indirectly to achieve such objectives. The paper also recognises that such measures can include, within their conventional historical meanings, both legal and regulatory mechanisms often characterised as “command and control” (CAC) approaches, as well as economic incentives based on market based instrument (MBI) approaches; although the paper adopts the currently received doctrine that such approaches are in fact, complementary, rather than substitutes.

The paper seeks to identify policy directions and opportunities through taking an inventory of current efforts, identifying potential policies within key issue areas at specific country case study sites, and generalising the lessons in a way that they can provide direction to all OECS Member States. In undertaking this work, the paper often seeks to draw explicit connections between the environment and economy through providing monetised impacts of the costs or benefits of environmental change. In deriving such estimates, the work relies on currently available government statistics, and uses best practices within the discipline of environmental economics. All figures are normalised to current terms to permit cross-country comparisons.²

It is acknowledged that there are a number of limitations to this study. The area of “environmental/economic” connections is very broad and one might imagine that it can be linked, in some fashion, to every human activity in OECS Member States and to every natural resource or environmental asset. Clearly, it is not the intent of this study to cover all of this ground. It can, at best, provide only a representative sampling of the issues. In so doing, some issues may be under-emphasised or omitted, even though they may merit some policy attention. Specifically, the study only touches upon certain global economic issues (e.g., climate change, biodiversity prospecting), and some important local issues receive little attention here (leaded petrol phase-out, toxic waste management). Also, the case studies provided draw from field visits to three areas – St. Lucia, St. Vincent and Antigua – and rely only on published material from other OECS Member States. Again, we reiterate that the intent of this paper is to provide a starting point and discussion piece to illustrate the policy options. Experience from other countries shows that, once one starts down the road of such policy reforms, one finds that such policies are limited only by one’s own imagination and creativity; that is, in fact, a key advantage of the adaptive mechanisms that are inherent in such processes and that are promoted through this type of initiative.

Outline of Paper

This paper is organised as follows:

- Section 2 on “Sustainability Issues in OECS Member States” expands on particular characteristics of small-island states that are germane to the analysis and design of market-based instruments and environment/economy linkages. The section focuses on a number of

² Unless otherwise specified, all monetary values are shown in EC\$. Conversion is conducted at a fixed exchange rate of US\$1 = EC\$2.70.

issues that were identified during stakeholder meetings and workshops in July 2000, and draws common threads of these together to show the economic and environmental importance of using an “island system management” approach.

- Section 3 on “Current Situation” describes current level of environmental policy efforts in OECS Member States. It uses current examples of revenue measures, expenditure measures, and other measures, drawing a number of conclusions from these relating to the efficacy and extent of such efforts.
- Section 4 on “Policy Options” describes the different intervention techniques potentially available, highlighting selected opportunities for their future use in the OECS. A series of local case studies is elaborated to draw out salient features of the available policies, including their limitations and opportunities. Case studies are selected to address key themes of interest to OECS Member States, including watershed management, integrated development planning, adaptation to climate change, biodiversity protection, environmental assessment, and sustainable resource use. Lessons from these analyses suggest certain policy priorities for each of these thematic areas.
- Section 5 on “Benefits of Action” describes the economic benefits associated with properly managing environmental assets. In many cases, this is equivalent to the costs or risks associated with *not* protecting natural and environmental resources. Building on the case studies, this section attaches economic values to some of the more important environment/economy linkages that occur in selected OECS Member States, extrapolating these, where possible, to the entire region.
- Section 6 on “Policy Recommendations” provides a practical set of recommendations and priorities for action. It commences with a discussion of three over-arching strategies relating to: (i) environmental resource pricing; (ii) a reorientation of revenues directly to environmental expenditures; and, (iii) systematic institutional strengthening and capacity development in priority areas. Specific priority policies, mechanisms and programmes are identified and elaborated. It concludes with some generalised near-term actions that are recommended to facilitate policy implementation.

2. Sustainability Issues in OECS Member States

The Challenge – The Small Island Context of Vulnerability and Scale

This chapter provides background on the general types of sustainability problems and issues that arise in OECS Member States. It draws from written material, interviews with stakeholders and planners, and workshops in the region that discussed priorities and opportunities. While many of the local issues that arise applied to a single country, most of the countries in the region will recognise a commonality with the types of environmental challenges that are identified. To a large degree, these commonalties arise because the countries share the attribute of being small islands. While it may seem like a gratuitous and obvious comment to state that all of the OECS Member States are small islands, the research around small-island states – particularly as it relates to environmental and economic issues and linkages – has been significant. Moreover, the research often generates conclusions and prescriptions that seem counterintuitive, primarily against the experience drawn from larger countries. This chapter therefore also reviews some of the results and lessons from this research.

“COUNTRIES are encouraged to develop fiscal and policy incentives and other measures to encourage environmentally sustainable imports and local products with low waste or degradable waste content.”

- Programme of Action on the Sustainable Development of Small Island Developing States, United Nations, 1994.

An important issue in both environmental and economic analysis is that of “scale”: systems that are readily analysed at relatively small scales defy analysis at larger scales as their general equilibrium impacts become less certain. Nowhere is this scale issue more pronounced than on small islands; both ecological and economic systems are closely interconnected and an external shock to any part of a small island system can have marked impacts in all sectors of the economy. This observation has created an extensive analysis of the potential vulnerability of small island states (McElroy *et al.* 1992; McElroy and de Albuquerque 1990; Streeten 1993), both to natural events (such as hurricanes and earthquakes) and to deliberate or accidental human impacts from social, economic or environmental policies.

The vulnerability implies that it is not generally possible to isolate ecosystem effects, as any impact in one part of the system will rapidly be translated to other parts of the system. This is clearly evident in many Caribbean island contexts. Most of the best soil in the eastern Caribbean was originally cultivated under export mono-culture, and subsequently resulted in erosion, deforestation and soil fertility degradation that affected the entire economy (Gajraj 1981). In some cases, this has also impacted hydrological equilibria, and the problems are exacerbated in the coastal areas of larger islands by sand mining, sewage discharge, thermal pollution and agrochemical runoffs (Rodriguez 1981; Thorhaug 1981). Economic or environmental interventions to correct any of these impacts also have a tendency to ripple through the entire economy. In particular, dependency on export markets has increased vulnerability substantially; a new vulnerability index developed by Briguglio (1995) suggests that island countries are substantially more vulnerable than non-island countries, and that small island developing states (SIDS) such as those in the Caribbean are the most vulnerable to economic shocks (Table 1). Indeed, under the rankings in 1995, five of the OECS Member States ranked within the top 10 world wide of “vulnerable” countries, with Antigua and Barbuda being ranked the most vulnerable country in the world.

Although the institutional disadvantages of being small are often stressed because of the inherent inability to take advantage of economies of scale, there are also a number of advantages (Streeten 1992). All of these stem from a greater flexibility of administration. Large organisations are not only more cumbersome than small ones, but there is a greater risk that information gets lost or distorted within organisational structures. The capacity constraints that are often touted within small developing countries therefore concomitantly provide an opportunity for interventions that involve decentralised decision-making; such conditions are precisely what are required for effective implementation of economic incentives relying on self-monitoring and low levels of government intervention in the decision-making process.

As shown in Table 2, typical characteristics for small island states in the OECS are markedly different from those in larger countries. Access to safe water is generally greater in smaller island states, the relative level of urbanisation in the country is lower, and natural resource dependence remains high in terms of its contribution to economic production. But all of the sectors are inter-linked. The major implication of the findings relating to vulnerability and scale is that a more holistic “systems” approach is required for achieving small island sustainability (Box 2). In particular, this implies not only that traditional single-sector interventions be discouraged, but also that administrative boundaries (for cities or districts) are less appropriate as an intervention basis. A systems approach recognises that the best way to tackle a given problem may be to address a part of the system that is apparently far-removed from the perceived problem.

Summary – Policy Lessons from Elsewhere

A fair amount of work has been conducted internationally now on sustainability, on environment-economy linkages and on the use of market-based and regulatory instruments. This paper explicitly addresses environment/economy linkages in Member States of the OECS. However, in contrast to other countries, the work relating to OECS Member States is approached from a somewhat different angle to reflect the following stylised facts about island states:

- small island vulnerabilities and institutional opportunities are conceptually different from those in larger countries. Extensive research over the past few decades has illustrated that economic, environmental and social vulnerabilities make small island communities more susceptible to external shocks. Also, however, the smaller size can be an advantage in pursuing low-cost interventions with low institutional overheads.
- the environmental challenge in small-island contexts is seldom a localised phenomenon. In large countries, environmental problems are often isolated to selected geographical areas, such as cities, specific river basins or air-sheds, or specific coastal strips. In small island contexts, however, the connections between activities and geographical areas are more pervasive and immediate such that all environmental issues tend to become linked.

Table 1

Vulnerability Indices

All Countries	0.447
Island Developing Countries	0.598
SIDS	0.635
Non-island Developing Countries	0.418
All Developing Countries	0.475
Developed Economies	0.328
Antigua and Barbuda*	0.843
Dominica	0.600
Grenada*	0.635
St. Kitts and Nevis*	0.733
St. Lucia*	0.715
St. Vincent and the Grenadines*	0.649

Source: Briguglio 1995.

* Within top 10 of most vulnerable nations.

Table 2									
Selected Indicators – OECS Member States									
Indicator	Anguilla	Antigua & Barbuda	British Virgin Islands	Dominica	Grenada	Montserrat	St Kitts & Nevis	St Lucia	St Vincent & Grenadines
GDP per capita (US\$)	4594	6738	29278	2369	2307	3695	5124	2583	1848
Population ('000)	16	71	21	72	102	8	42	155	113
Area (km ²)	91	442	153	750	344	102	267	616	389
Pop. Density (/km ²)	173	160	138	97	297	76	159	251	291
Resource GDP (%)	4	4	2	20	10	1	7	7	11
Tourism Exp. GDP (%)	69	48	65	16	25	13	27	44	25
Safe Water Access %	n.a.	95	n.a.	94	80	n.a.	100	98	93
Coast Line (km)	61	153	80	148	121	40	135	158	84
EEZ ('000 km ²)	n.a.	110	n.a.	15	27	n.a.	11	16	33
Literacy (% pop)	95	89	98	82	98	97	98	82	96
Health (Life Exp.)	71	74	73	77	71	76	68	70	73
Urbanisation (% pop)	12	36	n.a.	70	37	18	34	38	52
Notes: n.a. = not available. Resource GDP includes crops, livestock, forestry and fishing. Figures are for most recently available in 1997-2000 period. Per capita and population indicators are estimates for the year 2000 based on data from various sources. Sources: OECS Statistical Booklet 1998; Government of the British Virgin Islands; Government of St. Lucia; Pan American Health Organization (PAHO) and Caribbean Epidemiology Centre (CAREC); CIA Handbook; and World Conservation Monitoring Centre.									

As a consequence of these conditions, prescriptions for small island states will differ from those in other countries. The policy lessons can be summarised as follows:

- effective historical MBIs in small-island states are typically subsidy oriented to avoid distorting local comparative or absolute advantages. Attempts at imposing taxes, user fees, and other revenue instruments usually meet political and social resistance.
- *any* form of CAC structure is likely to be unenforceable unless self-monitoring structures are in place. Institutional capacity is often a pervasive weakness, exacerbated by under-funding of responsible agencies; “voluntary” regulations, self-monitoring, and private self-interest (e.g., in waste reduction or commercial marketing) often are more compelling mechanisms for achieving regulatory targets.
- complete fiscal decentralisation is readily implemented within capacity-constrained small-island institutional structures. As noted earlier, the lack of existing institutional infrastructure often makes it easier to decentralise both decision-making authority and revenue collection and expenditure tasks.
- institutional frameworks relying on ecosystem boundaries will be more successful than those relying on administrative boundaries, and in many cases the most realistic ecosystem unit will include the island as a whole. For larger volcanic islands, watersheds and specific coastal strips may also be appropriate ecosystem level

Box 2**Sustainability and Small Island States – Role of Island Systems Management (ISM)**

The vulnerability and complexity of small island states has given rise to the need for an Island Systems Management (ISM) approach that lends itself to such characteristics. Perspectives on ISM underline the need to integrate economic, social, and biophysical issues and policies within an adaptive and flexible institutional framework.

An Early Academic Perspective (McElroy and de Albuquerque 1990)

“The long-term viability of small tropical islands is defined as a systems problem requiring more holistic modelling of the ways island societies operate. Whereas the first generation of research on small islands reveals useful insights about the separate behaviour of the controlling dimensions of the island system – economic, demographic, socio-political and environmental – the second effort must capture the interactions among these subsystems so that effective and realistic policy measures for sustainable development can be designed. A preliminary step is to construct eco-development typologies that would classify island experience along an ecosystem stress continuum, identifying critical points and transitions, and suggest a research agenda for detailed case studies that would inform policy analysis.”

A Recent Operational Perspective from OECS-NRMU (Chase and Nicholls 1998)

“ISM is an adaptive management strategy which addresses issues of resource use conflicts and which provides the necessary policy orientation to control the impacts of human intervention on the environment. For ISM to be effective, it must be operationalised under a formal institutional and legal framework, co-ordinating the initiatives of all public and private sectors while ensuring through a unified approach that common goals are attained.”

Some Local Issues

A number of key issues were identified during workshops and meetings held in St Lucia, St Vincent and Antigua in July 2000, in support of this study. Participants at the workshops included representatives from Government ministries and departments (Agriculture, Environment, Finance, Fisheries, Forestry, Health, Parks, Planning, Public Works, Statistics, Tourism), quasi-non-governmental organisations (waste management authorities, utilities, independent parks authorities), private sector NGOs (Chamber of Commerce, Tourism Associations) as well as private business operators and opinion leaders.

The issues that were identified all demonstrate the interdependence of economy/environment interactions, and also draw out some of the institutional constraints and opportunities that are currently perceived. We here elaborate on two types of issues: (i) technical resource management issues; and (ii) institutional issues. In each instance, it shows how the issues from one sector permeate into the rest of the economy very rapidly in a small island context.

Resource Management Issues

The following four issues were consistently revisited during the discussions:

Watershed management. Deforestation, squatter and illegal settlement, agricultural encroachment, and neglect of existing (sub-marginal) crops have all contributed to declining environmental quality in the upper watershed. This occurs both on steep slopes, as well as in the plateau areas of some of the smaller islands. The problems up-slope have created further problems downslope that include loss of nutrients, sedimentation in river deltas, water shortages, water contamination, and siltation of the marine foreshore areas. Economic impacts that were noted include increased private and public maintenance costs for coastal and delta areas, decreased resource productivity in the coastal areas, and increased water procurement and treatment costs. In some instances, poor watershed

management has also undermined efforts at tourism development through degrading biodiversity or natural settings.

Tourism development. Tourism development and the service sector was often cited as the sector with the most visible and immediate connections to the environment. The sector is a direct and obvious beneficiary of a clean environment, while also imposing significant stresses on environmental resources. Water demands, sewage treatment requirements, and direct land-use requirements on sensitive beach-front areas were cited as the most immediate concerns. The tourism sector itself stated that it would be happy to comply with regulations provided there were adequate economic incentives to do so; failure to provide such incentives, it was asserted, would undermine the competitiveness of the industry and would risk loss of customers.

Waste management. Waste management problems have received significant support from recent initiatives to improve waste collection, landfill siting and development, and cost recovery mechanisms. Nonetheless, significant problems persist that include inadequate recycling incentives (causing, for example, plastic accumulation and related drainage problems in cities), persistent unsightly waste in key harbours and tourist areas, illegal garbage disposal on undeveloped sites, and persistent inability to deal with toxic and hazardous substances. It was emphasised that, while ship-generated waste seems to get some attention in some areas, the bulk of the waste management problem still relates to regular household and commercial waste. In some instances, the wastes create a direct health hazard.

General resource management and sustainability. There was a recurrent feeling that inadequate attention was being paid to sustainable resource management and use of “renewable” resources. This includes fisheries, forestry, marine resources, and sand. In all of these cases, incentives seemed to encourage over-use, with the public receiving little or no meaningful compensation for exploitation, while being expected to bear the costs of regulation and management. This has resulted in over-fishing, over-harvesting of forest areas, illegal mining of beach sand for construction, and degradation of biodiversity values that are an important basis for tourism. As a consequence, this is affecting the tourism sector, the construction sector, the household sector (through construction costs), and the general ability of local populations to engage in traditional livelihoods. It was noted that in many cases the impacts have occurred slowly but persistently over the past few decades, implying that people have slowly become accustomed to the degraded state, although many recall better days when fish were more plentiful, and trees harboured songbirds, that in turn kept insect pests at bay.

Institutional Issues

The following are cross-cutting issues to the extent that they were identified as important within all sectors:

Information availability. The availability of reliable and consistent information is seen as a persistent constraint to proper environmental management and planning. In many instances, information is not in an appropriate form (i.e., it is not specific to natural environmental planning units such as watersheds) or it is not readily accessible outside of the agency that generated the information. Much information remains in the private realm, and mechanisms that protect confidentiality are inadequate.

Fiscal decentralisation. There is widespread dissatisfaction with the current model of revenue collection that places all revenues into central public coffers, without a concomitant linkage supporting the environmental assets that generated those revenues. Forestry revenues, for example, seldom permit reinvestment in the forestry assets. Some cases have been identified that permitted limited “fiscal decentralisation” or earmarking of revenues (e.g., waste collection charges, and some revenues collected at National Parks). It was also noted that, if there were greater decentralisation, additional revenues could also be more effectively collected that would permit capturing some of the economic “rents” that were currently being foregone because of the under-pricing of resources (e.g., sand, fisheries, forest products).

Human resources and planning capacity. Limited human resources in the environmental sector constrain implementation capacity. In many cases this is simply because “The Environment” does not appear to have clear political or public support that would make it a favourable career choice. Institutions thus suffer from poor communications with other sectors, high turn-over rates in staffing, and more limited career choices and advancement. The institutions themselves are often under-funded, so that competent and trained staff simply do not have the resources available to pursue the objectives of their institutions. Hierarchical decision-making mechanisms that rely on centralised management structures (e.g., in central government ministries) further discourage innovation.

Use of voluntary mechanisms. Voluntary mechanisms were generally seen as an important institutional opportunity that has not been adequately pursued. Experience with such methods has been almost non-existent, with only limited uptake in the private sector in tourism development and by some commercial manufacturing firms. Internationally accepted methods for waste minimisation under “ISO” certification schemes, for example, have not been widely adopted or promoted.

In summary, prescriptive measures forthcoming from the meetings generally encouraged increased reliance on market-based measures that could create correct incentives for proper resource use, while also providing some scope for increased funding to key institutions. In addition, institutional strengthening should focus on adaptive planning techniques that acknowledged a greater emphasis on: (i) decentralisation or economic/environmental decision making, (ii) greater reliance on voluntary and non-regulatory measures, and (iii) greater attention to sustainable resource management.

3. Current Situation

Purpose

We here identify and describe existing environmental initiatives within the OECS Member States; their economic value is estimated using generally accepted methods and procedures. In some instances, these are cost-accounting measures involved with environmental expenditures, while in other instances they are based on direct revenues from selected charges or levies. Some other measures are also identified, even if they have no direct fiscal impacts. The general purpose of this exercise is to provide a summary of the current level of policy effort.

Examples given are those that could be readily obtained from existing sources. They are not intended to provide a complete picture of every single environmental initiative in all OECS Member States. At this time, no comprehensive enumeration of such initiatives has been undertaken as the initiatives are generally scattered among different ministries and no central information system exists for reporting or comparing them. We note that this aspect of the information, itself, may make it difficult to pursue harmonised initiatives.

A summary of the environmental initiatives is provided in Table 3. These are further discussed in this section, and some summary conclusions are drawn relating to the current level of policy effort and some implications for revenue ear-marking (Box 3) and policy harmonisation (Box 4).

“THE environmental protection levy collected pursuant to this Act shall be paid into the Consolidated Fund and shall be used (a) to defray the cost of protecting the environment; and (b) for the preservation and enhancement of the environment.”

Paragraph 7.
Environmental Protection
Levy Act of St. Lucia
1999.

Box 3

Earmarking: Pros and Cons

Ear-marking of revenues refers to the practice of directly linking revenue streams to specified expenditure commitments. The practice has long been admonished and avoided in public finance, for the simple reason that it unduly constrains the efficient allocation of public resources. Under ear-marking, the chances of under-funding or over-funding a given initiative (as compared to an ‘optimal’ funding level) increase dramatically. There are, however, certain theoretical conditions under which it can be justified. These circumstances usually arise when: (i) transactions and administrative costs are very high; (ii) revenues are related to the explicit provision of a service for a fee; or (iii) political pressures for accountability affect the efficient collection of revenues. In this latter case, people may only agree to pay a specific tax if they are satisfied that it is going to a programme or cause that they support. Governments around the world are discovering that many of these conditions apply within the environmental management sectors. Ear-marking the revenues generated by market based economic incentives to explicit environmental objectives is thus gaining increased favour in Latin America and the Caribbean.

In Brazil and Ecuador, ear-marked resource taxes are used to support environmental institutions. In Mexico, incremental gas taxes were used to finance the reduction of fuel evaporation from local service stations. In many countries in the Caribbean region, utility fees and tariffs are becoming more closely aligned with the cost of providing basic environmental services, and these revenues are increasingly being retained by the bodies that are responsible for financing those services.

To date, experience has demonstrated that ear-marking programmes are most successful where: (i) taxes or incentives are linked to existing collection mechanisms; and, (ii) amounts are made available to decentralised authorities for environmental programming or for institutional strengthening. At a political level, ear-marking is gaining support as it is found that such a cost-recovery approach may be easier to build consensus, remove barriers and guarantee budget resources to finance environmental institutions.

Table 3
Summary of Selected Current Environmental Initiatives in OECS Member States

Initiative/Mechanism	Member State(s)	Description
Revenue Measures		
Environmental Levy (Tourists)	All	Departure tax component dedicated to Environment of \$4.05 (US\$1.50) per person. Used for cost recovery by waste management authorities. St Lucia (1999) = \$2.06 million; (2000 est.) = \$2.54 million St Vincent (1999) = \$444,000; (2000 est.) = \$475,000 Antigua & Barbuda (annual) = approx. \$1.0 million
Environmental Levy (Other)	St Lucia (and others)	St. Lucia: The levy is applied to vehicles (\$300-400), tyres (\$5-10), used refrigerators and freezers (\$20), and batteries (\$10), as well as empty containers and goods in containers made of plastic, glass, metal or paperboard (1.5% c.i.f.). The levy is also applied to all "non-essential" imported goods (1% c.i.f.) Total estimated annualised revenue for budget year 2000 = \$4.6 million.
Waste Charges	All	Cost recovery tariffs and tipping fees will be instituted in all countries upon completion of local landfills and commencement of collection. In the meantime, some countries still show revenues accruing to central coffers. St Vincent (2000 est.) \$64,000
Forestry Taxation	Various	Revenues to central budget are estimated, for FY2000 to be: St. Lucia - \$60,000; St. Vincent - < \$200,000.
Fishery Taxation	Various	Revenues to central budget are estimated, for FY2000 to be: St. Vincent - \$120,000; Antigua and Barbuda - \$62,500.
Sand Mining Taxation	Antigua	Fees and royalties generated by sand mining permits are estimated to provide approximately \$1,000 in 2000.
Other Tourism Taxation	Antigua	Hotel taxation, guest charges, travel taxes and cruise ship passenger charges that are governed by five separate Acts and are not explicitly dedicated or ear-marked for environmental initiatives are, in 1999 and 2000, approximately \$50 million.
Protected Area Revenue	Various	These take the form of user fees on tourists or other protected area users. Nelson's Dockyard (Antigua) collects approximately \$3.5 million annually in fees. Soufriere MMA collects >\$200,000 annually. Scuba licenses in St. Lucia generate >\$5,000 annually for Dept of Fisheries. Nature trail fees generated \$233,000 for forestry dept in St. Lucia. in 1999
Expenditure Measures		
Cleaning Costs	All	No separate estimates available at time of DFR (included within drainage maintenance cost estimates).
Drainage Costs	All	Antigua and Barbuda (2000) = \$2.2 million (incl. some storm rehabilitation) St. Vincent (2000) = \$1.0 million
Storm & Erosion Damage Control	Various	St. Vincent (2000-2001) = \$23.026 million
Other Revenue- and Cost-Neutral Measures		
Recycling Systems	All	Limited recycling incentives for some glass containers. None for plastics. No recycling facilities.
Performance Bonds	St. Lucia, St. Vincent	Performance bonds as part of permitting for sub-division completion; not currently used for environmental controls.
ISO 9000 / ISO 14000	All	Industry is aware of certification schemes but has not applied these extensively.
Green Certification in Hospitality Industry	Antigua	Hotel and tourist association has commenced a voluntary program to increase awareness and attract commerce.
Notes: All figures in EC\$. Sources: Ministries of Finance Budget documents and responsible Authorities.		

Revenue Measures

Environmental initiatives in the form of taxation or fees generally have one of two objectives: revenue generation or incentive effects. In the case of revenue generation, the intent may be to generate new revenues for new initiatives, or to replace revenue streams for other initiatives (also sometimes referred to as “tax shifting.”) Incentive effects are typically related to a government’s desire to improve the sustainable use of resources or to reduce the impacts of some damaging activity; recycling taxes and resource royalties can fall into this category. Within OECS Member States, a number of revenue measures have been implemented to varying degrees, as shown in Table 3.

Various forms of environmental levies and waste charges are well underway as a component of harmonised waste management initiatives throughout OECS Member States. A common visitor levy on tourists is applied in all countries, a portion of which is earmarked for environmental initiatives. This is complemented by other import levies and domestic charges that will finance waste management efforts. In Antigua and Barbuda, Grenada, and St Lucia, for example, waste management budgets are of the order of \$6-7 million annually, with a near-term intent of financing up to two-thirds of these amounts through various levies, taxes and charges (the remainder will still be financed via central government subventions.)

Natural resource taxation is also common throughout OECS Member States, although the amounts collected are relatively nominal. Within a total budget of over \$400 million in St. Vincent, for example, forestry and fishery income generate less than 0.1% of total revenues, even though these sectors do provide important overall contributions to GDP. Similarly, resource taxation of mined resources (sand) shows patterns of under-pricing throughout OECS Member States; Antigua and Barbuda shows a revenue line for these in the annual budget documents but the entries are, at best, place-holders showing fee and license income of \$1,000 annually and royalty income of \$10 annually. Resource revenues typically fall far short of associated management costs. In St. Vincent, for example, the total revenues generated through the Ministry of Agriculture (also responsible for forestry and fisheries) is some \$370,000 whereas the total operational outlay on forestry, fisheries, botanical gardens and recreational sites is expected to be \$3.2 million in 2000.

Of growing interest as a tax base is the tourism sector and its associated revenue potential in natural and protected areas. In Antigua, revenues from tourist sector taxation (approximately \$50 million) exceeded the total of property taxes and income taxes in 1999, and will continue to be an important revenue source even as these latter two are increased in 2000. Throughout the region, however, growth of revenue has been most rapid for specialised decentralised activities such as nature trail walks, park revenues, and recreational licensing. These have often been connected to an ability to retain the revenue locally (such as in Soufriere Marine Management Area and the Nelson’s Dockyard National Park.)

Expenditure Measures

Estimating the direct level of public expenditures related to environmental initiatives is complicated because many expenditures are “joint products” with other initiatives. For example, road construction will generally include an unspecified environmental component to the extent that it must either mitigate environmental impacts (through environmentally acceptable proper road

alignments) or compensate for environmental problems that may already exist (such as poor drainage). The estimates in Table 3 are thus only a very preliminary, and likely lower bound, estimate of the types of costs associated with direct environmental initiatives. Also, they exclude indirect costs associated with medical or human health conditions that may arise from pollution or environmental illnesses.

A comprehensive picture of typical environmental costs associated with persistent problems and “environmental emergencies” can be gleaned from the St. Vincent budget, which shows a budgetary requirement of approximately \$24 million for storm damage and drainage control in 2000 and 2001. This consists of road reparation, bridge rehabilitation, drainage improvements, river defences, and various coastal protection projects to offset the damage from recent storms. It is noted that some of these costs are, in fact, for feasibility work only (e.g., at Layou) and the actual costs will likely be much greater. Other islands have also been hit to varying degrees. For example, the total impacts on St. Lucia of Tropical Storm Debbie in 1994 are estimated to have been of the order of \$230 million.

Other Measures

Finally, we note that not all programmes have revenue or cost implications for programme participants (private or public). Deposit/refund schemes have been in place at one time or another in all OECS Member States, although in some cases they are no longer comprehensively implemented because of lack of facilities (e.g., St. Lucia). Voluntary schemes for environmental protection (e.g., certification schemes spear-headed by private sector participants) have also seen some limited level of interest. Also, liability schemes associated with performance bonds and guaranties around environmental compliance have been discussed in some fora, although they have not been implemented even though the regulatory mechanisms may be in place.

Summary

There is some experience with drawing connections between the environment and the economy in the environmental initiatives, but a number of observations can be made. These in turn point to potential areas of reform.

- There is very limited experience with revenue mechanisms, experience that does exist is tied to revenue objectives (as opposed to addressing incentive effects) and is focused primarily on waste management. Institutional capacity to implement such schemes in other areas thus remains weak.
- Resource rent collection is exceedingly small and most resources are under-priced or un-priced, with available revenues not usually targeted to expenditures. There are very few cases in which earmarking of resource revenues occurs, with most collection going to central coffers. Increased earmarking of revenues may improve resource management while also providing opportunities for institutional strengthening (see Box 3.)
- Substantial efforts have been made to harmonise some initiatives across Member States. Other initiatives seem to be delayed to permit some Member States to “catch up.” The overall philosophy regarding harmonisation deserves to be revisited as experience elsewhere demonstrates that, in many cases, the lack of harmonisation of environmental policy does not, in fact, create economic distortions (see Box 4.)

Box 4**Harmonisation of Environmental Policy: Is it Really Necessary?**

OECS Member States have long held that harmonisation of policies is an important condition of rational planning and policy development. The concept of “harmonisation” is even enshrined in the Treaty of Basseterre. The premise has been that, absent such harmonisation, the competitive and comparative advantages of single countries may well be undermined through trade distortions or concomitant distortions in labour or capital mobility. In many instances, such harmonisation has indeed proven to be an effective means for coherent and common institutional strengthening. Based on such premises and experience, the OECS-NRMU explicitly has a responsibility to provide “a harmonised approach to providing the policy, legal and administrative framework for the establishment of a regional programme for monitoring and controlling the marine and land-based environment.”

But one may, at this juncture, legitimately ask, “To what extent is harmonisation necessary for environmental initiatives?” Experience elsewhere (Ekins 1999, Zhang 1999) has shown that, while certain general policies (e.g., polluter pay principle, precautionary principle, etc.) may be important common foundations for environmental policies, actual implementation mechanisms and schedules can differ markedly without creating any of the presumed distortions. Some examples illustrate this:

a) cost impacts of initiatives. It is often widely assumed that initiatives will have distorting trade impacts. In fact, experience shows that the costs to industry of environmental regulation are often very small (typically <3% of factor costs). In many instances, the regulations generated a small benefit for commercial interests because of better material handling practices and reduced maintenance costs.

b) creation of pollution havens. It was often widely assumed that un-harmonised policies would create pollution havens where lax standards existed. The world economy has now witnessed about 20 years of un-harmonised policies among nations and, to date, there has been only one such pollution haven that can be unequivocally identified (the US/Mexico border). Evidence shows that investment decisions are not, in fact, tied strongly to environmental regulations or costs and that they are more strongly tied to labour conditions and other factor costs.

c) offsetting influences. It was largely assumed that environmental initiatives had incremental impacts with no associated benefits. In fact, even at a macro-economic level, other off-setting adjustments come into play. Within the European Union, for example, a harmonisation policy attempted to co-ordinate all environmental taxation policies. Consensus has never been achieved and eleven of the member states have implemented unilateral reforms that differ markedly in various aspects. To date, no trade or other distortions have been detected. This is widely attributed to off-setting impacts that have been instituted as components of these reforms. For example, in one case an increase in environmental taxation was off-set by decreases in other forms of payroll taxation. In many countries, higher environmental taxation also permitted institutional strengthening and reduced private sector administrative burdens. In all of these cases, again, however, the direct effects and the net (compensated) effects were small with respect to overall economic activity.

4. Policy Options

Introduction

The purpose of this section is to address the range of opportunities for economic benefit to be derived from the sustainable management of the environment. These will be identified from the perspective of the management of the environment as an economic resource and service according to broad environmental planning themes that are a priority for the OECS Member States. Within this context, the section enumerates a range of specific available policy instruments. The chapter then elaborates a series of case studies from within the OECS to show, within each thematic area, what the best available policy options and opportunities might be. It should be noted that the case studies are meant to be illustrative; they are selected to provide a cross-section of issues and are intended to draw, where possible, on actual or potential success stories from within the OECS Member States. Note also that the case studies focus on the three countries visited during the field work: St. Lucia, St. Vincent and the Grenadines, and Antigua and Barbuda; but many of the lessons from these countries can be extended elsewhere.

“LEGISLATION is really not the critical factor in environmental improvements. Legislation cannot guarantee that the intent of the legislator will be implemented in practice. The major problems result from the difficulty of establishing control and enforcement mechanisms to apply the legal provisions.”

United Nations Environmental Programme, 1976.

Environmental management within the OECS has to date been focused along some broad priority themes. These themes include: (i) integrated watershed management; (ii) integrated development planning; (iii) adaptation to climate change; (iv) protection/enhancement of biodiversity, in both marine and terrestrial contexts; (v) environmental assessment; and (vi) the application of sustainable practices to fishing, forestry, tourism, agriculture and other sectors. These themes are relatively comprehensive, to the extent that they permit local management authorities to address local priorities. They cover key natural resource sectors, while also allowing specific problems such as toxic waste or air pollution to be addressed within selected planning frameworks. What is lacking, however, is any explicit guidance regarding the efficient or equitable use of scarce natural, human and financial resources. Much of this remaining direction is accommodated within the “Provisional St. George’s Declaration of Principles for Environmental Sustainability in the OECS,” (OECS 2000) which does provide a framework that entrenches the importance of sustainable resource management and the connections between social, economic and environmental goals. Specific recommendation regarding the environment/economy interface are the subject of this paper.

This chapter will assist in identifying specific policy opportunities associated with each of these themes. For each case study, the nature of these opportunities addresses their potential to contribute to economic development, while also identifying any relevant barriers to achieving this potential. Given that the case studies focus on success stories, the studies also point to ways that key institutional barriers can be overcome while structuring environmental management as an economic service.

Potentially Available Policy Instruments

A number of general economic principles form the background philosophy for an economically and environmentally sustainable strategy. The two most often enunciated include the polluter pay and

precautionary principles. The polluter pay (or user pay) principle assigns rights that allow internalisation of costs that would not normally be incurred by the polluter or user (“externalities”). They create the incentive effect that is intended to promote proper resource use. The precautionary principle provides a mechanism for dealing with the uncertainty of impacts (Perrings 1991; O’Riordan and Cameron 1995), and is also an underlying focus of adaptive management within an Island Systems Management framework.

A number of mechanisms have been developed and used to promote these principles (Tietenberg 1990, 1996, Eröcal 1991, Kreimer et al. 1993, Bates et al. 1994, Panayotou 1995). At one extreme, they include fines or sanctions that are linked to traditional command and control (CAC) regulations. At the other extreme, they include laissez-faire approaches that require consumer advocacy or private litigation to act as incentives for improving environmental management. In between, we find more familiar tax and subsidy approaches as well as the less familiar mechanisms relying on traded property rights. All of these approaches, in their own fashion, attempt to internalise environmental costs.

Table 4 illustrates the broad spectrum of instruments that might be available, all of which implicitly or explicitly have some incentive effect. These fall across a continuum ranging from very strict command approaches to decentralised approaches that rely more on market or legal mechanisms. Even traditional CAC regulations, with heavy fines, create a presumed incentive effect because a polluter would be compelled to comply with the regulations to avoid the sanctions. In principle, therefore, there is a wide range of methods available for attempting to regulate or manage environmental quality. Each of these intends to address a variety of goals.

One goal associated with decentralised decision-making relates to cost-effectiveness. The asymmetry of information, for example, often implies that private firms are more likely than governments to identify the most cost-effective means for achieving a given level of pollution control. This forms the basis for the common theoretical result that – if one focuses entirely on private costs – strong forms of MBIs are more cost-effective than their weaker counterparts or than CAC approaches (Tietenberg 1992).

Another fundamental goal of most environmental regulatory systems is to decrease externalities. Externalities exist where the agent making the production or consumption decision does not bear all of the costs or benefits of this decision. Externalities abound in environmental issues. Pollution disposed of into a waterway may be a low cost solution to waste disposal for the polluter, but firms and individuals downstream may suffer consequences through higher costs from lost fishery production, higher water treatment costs, lower amenity values (for recreation) or loss of critical drinking water supplies. Most economic incentive structures attempt to transfer some of this cost back to the individual responsible for the decision. A similar situation could exist with environmentally beneficial decisions; a firm that cleans polluted intake water and then discharges clean water after using it in its internal process would, in fact, be creating a positive externality and, in such cases, it could be argued that it is optimal to provide subsidies to such a firm in direct proportion to the value of this external benefit.

A third goal that many policy-makers have when designing an appropriate economic incentive system is that associated with revenue generation. There are, however, practical trade-offs to consider between revenue generation and incentive effects. In principle, it would be possible to levy a very high charge that effectively discourages all polluting activity. Abatement levels would be very high in such a case, but no revenue would be generated. Similarly, very low charges would

generate little revenue and generate little abatement because there is no incentive for firms to reduce pollution. Typically, the abatement/revenue function is an “inverted U” which maximises revenue at some intermediate level of abatement. A policy decision must be made relating to how much additional revenue (beyond the maximum) a government is willing to give up to generate higher levels of abatement. The answer to this policy question should be related to the marginal benefits of pollution abatement, but it is, in fact, typically more a function of government budgetary realities that regard such taxes as a convenient means for underwriting environmental management efforts.

Table 4.
Classification of Policy Instruments (adapted from Serôa da Motta, Huber and Ruitenbeek 1999)

<-----MINIMUM FLEXIBILITY----->		<----- MODERATE FLEXIBILITY ----->		<----- MAXIMUM FLEXIBILITY ----->	
<--- MAXIMUM GOVERNMENT INVOLVEMENT --->			<--- INCREASED PRIVATE INITIATIVE --->		
<-CONTROL-ORIENTED->		<-----MARKET-ORIENTED----->		<-LITIGATION-ORIENTED->	
Regulations & Sanctions	Charges, Taxes, & Fees	Market Creation	Final Demand Intervention	Liability Legislation	
General Examples					
<u>Standards:</u> Government restricts nature and amount of pollution or resource use for individual polluters or resource users. Compliance is monitored and sanctions made (fines, closure, jail terms) for non-compliance.	<u>Effluent or User Charges:</u> Government charges fee to individual polluters or resource users based on amount of pollution or resource use and nature of receiving medium. Fee is high enough to create incentive to reduce impacts.	<u>Tradable Permits:</u> Government establishes a system of tradable pollution or resource use permits, auctions or distributes permits, and monitors compliance. Polluters or resource users trade permits at unregulated market prices.	<u>Performance Rating:</u> Government supports a labelling or performance rating programme that requires disclosure of environmental information on the final end-use product. Performance based on adoption of ISO 14000 voluntary guidelines (e.g., zero discharge of pollutants, mitigation plans submitted, pollution prevention technology adopts, reuse policies and recycling of wastes). Eco-labels are attached to “environmentally friendly” products.	<u>Strict Liability Legislation:</u> The polluter or resource user by law is required to pay any damages to those affected. Damaged parties collect settlements through litigation and court system.	
Specific Examples of Applications					
<ul style="list-style-type: none">• Pollution standards• Licensing of economic activities• Land-use restrictions• Construction impact regulations for roads, pipelines, ports, or communications grids• Environmental guidelines for road alignments• Fines for spills from port or land-based storage facilities• Bans applied to materials deemed unacceptable for solid waste collection services• Water use quotas	<ul style="list-style-type: none">• Non-compliance pollution charges• Greening of conventional taxes• Royalties and financial compensation for natural resources exploitation• Performance bonds posted for construction standards• Taxes affecting inter-modal transport choices• Taxes to encourage re-use or recycling of problem materials (e.g., tyre taxes, battery taxes)• Source-based effluent charges to reduce downstream water treating requirements• Tipping fees on solid wastes• User charges for water	<ul style="list-style-type: none">• Market-based expropriation for construction, including environmental values• Property rights attached to resources potentially impacted by development (forests, lands, artisanal fish)• Deposit-refund systems for solid and hazardous wastes• Tradable permits for water abstraction rights, and water and air pollution emissions	<ul style="list-style-type: none">• Consumer product labelling (Eco-labels) relating to problem materials (e.g., phosphates in detergents)• Education regarding recycling and re-use• Disclosure legislation requiring manufacturers to publish solid, liquid and toxic waste generation• Black-list of polluters• Voluntary self-regulation of industry	<ul style="list-style-type: none">• Damages compensation• Liability on neglecting firm’s managers and environmental authorities• Long-term performance bonds posted for potential or uncertain hazards from infrastructure construction• “Zero Net Impact” requirements for road alignments, pipelines or utility rights of way, and water crossings	

Finally, policy-makers are continually faced with high levels of scientific uncertainty in designing regulatory systems; one goal of intervention is to address uncertainty. This has caused some analysts (Lonergan *et al.* 1994) to recommend the use of surcharges to deal with some of the uncertainties of resource use in a complex system.

The relevant question becomes, “Which policy options or measures are most effective in addressing the sustainability objectives inherent in each of the OECS thematic areas?” To answer this, we construct six different case studies to illustrate how different instruments might be used. For each case study we provide a general description of the case, review the management objectives, analyse specific environment/economy linkages using available information and standard techniques, select and analyse a short list of potential policy options for achieving management goals, and then generalise some of the lessons that might be drawn from the case, paying particular attention to institutional realities within OECS Member States.

Case I – Watershed Management

The basic concept behind watershed management is that the entire geographical unit must be treated as an inter-related whole that recognises the physical impacts that one activity in the watershed may have on other activities or opportunities in the watershed. From an institutional perspective, watershed management requires the unwavering co-operation of stakeholders within the boundaries; in many parts of the world separate (and sometimes independent) authorities have been established to facilitate such co-operation. This case study focuses on the Mabouya Valley on St. Lucia and demonstrates the extent of the environmental and economic linkages that can occur in a watershed, and points to some policy options for managing them.

General Description. The Mabouya Valley Development Project (MVDP) commenced operations in 1989 to implement a comprehensive development programme in the Mabouya Valley. The valley forms part of the Dennery basin on the east coast of St. Lucia, rising from sea level to about 460 metres. The valley comprises a number of estates totalling some 4000 hectares, constituting one of the largest expanses of fertile land on Windward side of the island. The area also comprises a 169 hectare coastal component in the Fond d’Or Bay, which has more recently been inaugurated as a nature and historical park.

Management Objective. The general management objective in the watershed is to contribute to economic development in a socially and environmentally sensitive manner. The planning must address a series of challenges that include illegal squatters, illegal forest conversion, decline of cash crop prices, siltation of downstream rivers and sedimentation of foreshore areas that affect fishing grounds. The Fond d’Or Nature Park is faced with the additional challenge of protecting important turtle nesting areas from encroaching development, sedimentation, and sand mining.

Environment/Economy Linkages. Many of the environmental economic linkages involve trade-off decisions between various forms of land use within the watershed. The area population is approximately 12,000, and the economic base of the valley has shifted over the past decade. Banana cultivation is currently a sub-marginal crop, and forests planted for fuelwood are not being managed because fuelwood demand has given way to increased use of gas. Chemical pesticides and fertilisers are still being used and much of this makes its way into watercourses that affect downstream populations on the coast. An analysis of the primary products within this watershed indicates the following:

Net value of agricultural production	\$ 2–5 million/year
Net value of forest production	0 million/year
Water quality value	approx. 4 million/year
Coastal land protection value	3–6 million/year
<u>Tourism/biodiversity value (Fond d'Or)</u>	<u>not estimated</u>
Maximum System Value	\$ 15 million/year

The ranges correspond to likely ranges for crop prices, wage rates, and land values in this area. The maximum watershed system value assumes that the activities in one sector do not infringe upon opportunities in others. Evidence suggests, however, that this is not the case. Continued agricultural production under current modes will, inevitably, degrade the water quality and coastal values. And failure to maintain the forest intact will contribute to soil erosion. In fact, without positive interventions it is likely that the only system value will be that attributable to very marginal agricultural production.

Policy Options. Within a watershed management framework, it is clear that there exists significant potential for proper resource management. Objectives of such interventions would focus on: (i) capturing some of the currently uncapturable values associated with coastal and biodiversity protection; (ii) reducing the externalities associated with marginal agriculture; and, (iii) creating incentives to stabilise the upper watershed forest estates. Policies that can achieve this would focus initially on implicit subsidies; any subsidies that are afforded to sub-marginal agriculture are a drain on efficient economic production and contribute, in this instance, to degraded environmental quality that has costs which exceed that of the value of the agricultural production. Specifically, it would require reduction of agrochemical subsidies (this has already occurred in the MVDP), and encouragement of cash crops that improve soil stability (this has also occurred through the encouragement of vegetable crops.) Also, incentives could be afforded to improving tenure within the forest zone, reducing indiscriminate and illegal harvesting of trees; within the MVDP this is contemplated to occur through entrenching tenure rights in the forest area. Finally, increased value of the natural resources can be captured through marketing of nature reserve; within the MDVP this is being achieved through charging fees for use of the nature trail, which are in turn re-invested to improve local infrastructure and monitoring. Through a combination of economic policy mechanisms – reduction of subsidies, improvement of property rights and land tenure, use fees for recreational activities – sustainability of the watershed is enhanced.

Although such interventions will enhance system value, a number of barriers to implementation still remain. Foremost, the watersheds management institutions do not as yet include all of the affected stakeholders. Residents in Dennery are directly affected by the project, and by the water quality and erosion impacts in the lower watershed; to date they still bear most of the direct mitigation costs of environmental degradation (e.g., drainage clearance, dredging of river mouth). Institutional development thus lags the implementation process, and no mechanism exists to redistribute some of the financial benefits that might accrue from some of the activities within the watershed.

Conclusions and Lessons. Notwithstanding the institutional barriers that remain, the case provides a good example of how economic trade-offs can be addressed within a watershed management scheme. Quite often economic policy reforms involve the *removal* of an economic instrument rather than the creation of a new one. Economic policies that implicitly subsidise uneconomic activities are typically the first items targeted for removal; in so doing it improves public finances while also reducing environmental externalities. Next, one can consider introducing new policies that improve incentive structures; in this case the land tenure reforms provide a revenue neutral intervention that

reduces downstream costs. Finally, specific revenue instruments can be introduced to attach a price to previously untraded resources (in this case, recreational or biodiversity resources), with a view to recycling those revenues within the watershed area where they can assist in institutional strengthening and capacity development (as opposed to sending them to central government coffers).

Case II – Integrated Development Planning

The concept of integrated development planning is similar to watershed management, except that it can be applied to any geographic boundary, including administrative boundaries. It is most often applied to industrial estates, urban or peri-urban development, or any zone where multiple land-uses may come into conflict. The role of integrated development planning is generally to minimise conflicts and devise an optimal spatial mix of activities, providing a basis for common infrastructure design and placement. Environmental issues are often addressed within an IDP by looking at ways to minimise waste flows through recycling, through taking advantage of economies of scale in environmental management, and through permitting cross-subsidisation of activities that might not otherwise be financially viable. This case study focuses on the Nelson's Dockyard National Park (NDNP) on Antigua as a successful example of how environmental and economic objectives can be concurrently met.

General Description. While it may seem unusual to include a national park as an example of integrated planning, the case of NDNP illustrates well the opportunities that are afforded through such planning. NDNP was established in 1984, and – with a size of 3885 ha – includes approximately 8% of the land area of Antigua; a marine component of the park extends out to the territorial limit and protects two adjacent reefs: Mamora Reef (0.75 km²) and Cades Reef Marine Sanctuary (2.5 km²). At an initial infrastructure cost of approximately EC\$20 million, the park is zoned as almost 60% wilderness or other conservation, 10% habitat preservation, 3% mangrove, 15% mixed agriculture and residential, 5% heritage sites, and the remaining (almost 10%) as recreation, resort, community, commercial and tourism development. As an important historical and natural site, the park typically attracts 20% of the cruise ship passengers and stay-over visitors, and accounts for 92% of the yacht arrivals. The park operates as a financially autonomous management authority, collecting its own revenue and managing these for infrastructure development and operation of park facilities. A Park Commissioner consults with local community, local authorities, and other persons, while overseeing the day-to-day operations of the Park and reporting to central government. Local residents and commercial operators share in the management costs, and benefit from revenues received through park operations. The park area boasts 5 hotels, 33 restaurants, and serviced moorage, and operates its own sewage treatment plant, 2 sewage pump-outs, and garbage trucks that also serve the broader community. Key natural features include Indian Creek, sea turtle breeding grounds at Rendezvous Bay, and bat caves further inland.

Management Objective. The objectives of park management are as follows:

- To protect the important natural and historical features of the Park and to manage these features so as to encourage enjoyment and appreciation by residents and park visitors;
- To create a unique world class tourism destination area based on the Park's natural scenic beauty, heritage resources and a healthy yachting industry;
- To create a sound environment for economic development in the Park;

- To maintain and improve the quality of existing residential environments within the Park;
- To provide services and facilities to communities and businesses within the park consistent with the objectives of this plan.

In pursuing these objectives, the park specifically seeks to strengthen the economy in the following sectors: (i) *agriculture* through producing and marketing local Antiguan food products; (ii) *transportation and tourism* through affording maximum enjoyment and understanding of the area's history; (iii) *construction* through offering modern, efficient construction services; and, (iv) *handicrafts* through promoting the culture and heritage of Antigua.

Environment/Economy Linkages. The key linkages evident at the park involve those related to the effective protection afforded by park monitoring and enforcement. The park protects near-shore and foreshore natural resources, mangroves and beaches, and provides a mechanisms for dealing with environmental mishaps. Responses to recent storm damage ("George") were swift, permitting new facility construction and increased revenues from rentals of that facility, and funding is currently being lined up to restore valuable heritage docks that have been in place since Nelson's time. Operation of the sewage plant and garbage truck keeps the area beaches and the surrounding environment clean, enhancing the visitor flows. Direct revenues from day-to-day operations of the Park generate approximately \$3.5 million annually, which are in turn ploughed directly back into Park operations (including a payroll of \$1.2 million). A remaining management challenge is to better protect the environmental resources of the Park; the focus to date has been on the heritage resources but it is now acknowledged that environmental services are of significant value and interest. A recent minor oil spill in the Park (successfully cleaned up), underlined the need for emergency response plans. Vagrants are also a problem. Efforts are being made to support new environment-based tourism services, including offshore diving in nearby marine parks. No estimate has been made of the economic potential of such activities, but based on typical international levels of payments we estimate local natural values within the NDNP to be as follows:

Conservation Areas	\$ 5.8 million/year
Mangrove Areas	1.2 million/year
Beach and Shoreline Areas	12.9 million/year
<u>Coral Reef and Marine Areas</u>	<u>6.6 million/year</u>
Maximum System Value	\$ 26.5 million/year

Policy Options. The policies and mechanisms that have been used within the integrated plan of the Park serve as a model of success. The specific mechanisms include: (i) a park user fee (EC\$13) charged to all visitors; (ii) lease rents for private operators within the park (EC\$5/ft²/yr); (iii) moorage fees for yachts (US\$5/ft/d anchorage or US\$45/ft/d slip); (iv) environmental surcharges for yacht visitors (US\$1/d/person). All revenues are collected and retained by Park authorities. These instruments are all used with revenue collection in mind, and perform no specific incentive function; through financing the local institutions, however, enforcement and monitoring of park regulations is successful. Scope still exists for expanding the revenue base as management extends to more environmental services; additional charges may need to be introduced to cover tipping fees, for example, once Antigua's landfill is made operational. With existing accounting and revenue collection procedures in place, however, the addition of such an instrument will not create large administrative burdens.

Conclusions and Lessons. The primary lesson from this case study is that an autonomous body – that is responsible for a diversity of activities within a common spatial boundary – can be an economically efficient and environmentally effective mechanism. The decentralised decision-making that such a system affords permits efficient collection and deployment of revenues, and permits an optimal set of regulations or market-based instruments to be used for area management. Moreover, the case demonstrates that “command and control” regulations and market incentives can be important complements within a well-organised institutional structure. Finally, an additional lesson from this is that the diversity of revenue sources will permit this particular authority to weather any unforeseen changes to a single income stream.

Case III – Adaptation to Climate Change

Although the reality of global climate change has not yet been unanimously accepted, the Intergovernmental Panel for Climate Change (IPCC) now regards such change as inevitable. Circumstantial and scientific evidence point to increased variability in climate, with severe weather events becoming increasingly more common. While the IPCC identifies two necessary types of strategies – mitigation and adaptation – for dealing with such change, the island Member States of the OECS will need to focus, primarily, their attention on adaptation strategies. Some degree of sea-level rise and increased occurrence of severe storm events is indicated, and preparing for such is a key component of any precautionary adaptive strategy. Within that context, this case study focuses on beach setback and coastal erosion issues, drawing on evidence from Antigua and St. Lucia to demonstrate the role of economic policy in protecting these values.

General Description. Coastal erosion is a complex issue, with many contributing factors. Beaches form an obvious connection to tourism trade, and everybody would acknowledge that pristine beaches are an important economic resource. But even under natural conditions, beaches can change. Storms may wash beaches away, but such beaches are also continuously replenished through wave action and sand migration. In principle, beaches may even be regarded as a renewable resource, as small losses of sand are replaced through natural mechanisms. Different factors contribute, however, to the erosion of beaches and associated shorelines. These mechanisms can be on-shore or off-shore, human-induced or natural. Increased storm incidence, for example, is an obvious offshore influence. Less obvious, perhaps, is the function of fringing coral reefs and similar barriers that act as a buffer to wave action; coral reef degradation can in turn lead to coastal erosion. On shore influences are also influential; loss of vegetation in near-shore areas removes an important buffer that would otherwise support beaches and coastal areas. On Antigua, for example, persistent deforestation of sparse trees near beaches has contributed to shoreline erosion. More obviously, the direct mining of sand for construction is a major cause of beach degradation; as noted in Chapter 3, beach sand is essentially a free good and it is often taken without considering broader environmental impacts. Finally, construction too close to the shoreline also undermines the functional capabilities of natural systems to create a buffer that protects both the shore and the infrastructure built close to the shore. Recent storm damage to hotels, restaurants, and roads throughout the Eastern Caribbean bears witness to the fact that improper development can lead to dire economic consequences.

Within a development planning framework, beaches can be seen as an important resource. Countries are grappling with the management of this resource. In Antigua, sand is consistently mined for construction and setback requirements for shoreline developments are under review. In

St. Lucia, similar issues arise, and recent storm damages (approaching \$250 million) underline the importance of protecting beach areas.

Management Objective. The general objective of beach sand management is to support the direct economic uses of beach sand (both potentially for construction and recreation) while maintaining their environmental functional integrity intact.

Environment/Economy Linkages. The key linkages for beach areas relate to their use as recreational land and as a resource for road and building construction. On St. Lucia, the land asset value of the coastal areas of the country within a critical buffer zone (taken as a minimum 20 meter setback) is estimated to be approximately \$300 million. A similar area on Antigua and Barbuda is estimated to have a value of \$1.5 billion. Removing sand from this area or directly building infrastructure on this area degrades this value as it undermines the functional support that can be afforded by this protective strip.

Policy Options. Countless policy options are available to address the protection of coastal areas. The most commonly used have been those associated with strict regulatory approaches. On Antigua, this involves a setback requirement; for example, the usual historical requirement is that no construction can occur within 45 meters of the shoreline. This legislation is currently being revisited to define different setback requirement for different parts of the island, ranging from 20 meters to 100 meters. Similar regulations have been in place in St. Lucia, and both countries have used regulatory approaches to limit sand mining to those areas where a license or permit is granted; fees for such licenses are nominal, and no monitoring is conducted. Experience with these approaches here and elsewhere in the OECS have been far from successful. Setback requirements have not been honoured, sand mining continues without licenses in the absence of effective monitoring, and no incentives are in place to promote sustainable management of coastal areas. Sand-mining bans are often suggested as a potential policy option, but without substitutes available such bans are likely to meet the same types of enforcement problems. Non-regulatory economic policies provide an important opportunity to address the weaknesses of strict regulatory approaches. Potential options would include:

- *sand pricing.* For mining operations, this involves increasing the revenue collected for sand mining to a degree that reflects the opportunity cost of the resource. At this time, sand prices in Antigua are typically of the order of \$80/ton, with no “royalty” element in it. At this cost level, it still represents less than 15% of the typical completed cost of standard construction (housing and building) projects. Placing a royalty of this order of magnitude on sand will have the following effects: (i) it will create an incentive to conserve sand and find substitutes; (ii) it will create a one-time maximum increase of 15% in construction costs, although the actual impacts will likely be less because of substitution effects; (iii) it will generate revenue to responsible authorities for monitoring and implementing coastal management practices. Different royalty models (e.g., a 30% gross royalty) would provide similar incentives and impacts; precise design of any such system would require consultation of multiple stakeholders.
- *performance bonds and guaranties.* Development permitting is often tied to a large number of economic incentives, with continued enjoyment of such incentives if and only if certain performance conditions are met. In the case of setback requirements, both Antigua and St. Lucia currently have mechanisms in place that would permit use of financial performance bonds to obtain compliance. Failure to comply with development conditions

would result in forfeiture of the bond. Related to this, tax exemptions (currently enjoyed by many foreign investors) could be directly tied to environmental compliance that is monitored on an ongoing basis.

Conclusions and Lessons. The primary lessons from an investigation of coastal erosion issues show that: (i) regulatory mechanisms by themselves are inadequate to ensure compliance because there are no resources available for monitoring and enforcement; and, (ii) correct resource pricing can improve the incentive effects and the revenue opportunities associated with coastal erosion. We note that royalties from sand mining are likely to generate revenues surplus to that required for monitoring and enforcement; these could, in turn, be used for other environmental initiatives, for reducing taxation in other areas, or they could be dedicated to a “precautionary fund” that would be available for emergency expenditures.

Case IV – Biodiversity Protection

The economic value of biodiversity has gained increasing importance over the past two decades as natural habitats have come under increased human pressure. Recent human-influenced losses of biodiversity and species have been referred to as driving the “sixth mass extinction” (Morrell 1999), on par with five previous extinctions that eradicated at least 17% of families (the most recent being the cretaceous mass extinctions 65 million years ago that saw extinction of the dinosaurs). Many nations have responded by committing themselves – through international conventions such as the Biodiversity Protocol – to increase efforts at protecting both marine and terrestrial biodiversity. In this case study, we look at the islands of St. Vincent and St. Lucia, to elaborate the economic values of the existing biodiversity and to demonstrate how economic policy mechanisms can be beneficially used to protect biodiversity.

General Description. The governments of St. Lucia and St. Vincent and the Grenadines have recently completed substantial research to describe the content and condition of their respective countries’ biodiversity. The biodiversity reports produced by these countries detail the flora and fauna of terrestrial and marine ecosystems, the stresses on these ecosystems (human induced and natural), and the institutional arrangements governing them. The studies recognise the importance of biodiversity (genes, species, ecosystems) both in terms of its end products (fish, timber, fresh water, etc.), and in its functional values (erosion control, storm protection, nursery, etc.). However, only economic values for those biological resources that pass through formal markets are estimated. In this case study, economic values for a broader range of products and services of biodiversity are calculated for terrestrial and marine biodiversity, for both St. Lucia and St. Vincent and the Grenadines. It thus discusses biodiversity protection and maintenance issues from a national perspective using information available in the two country studies. In brief, it permits economic assessment of the national assets – terrestrial and marine resources.

Management Objective In both countries, the development of a National Biodiversity Strategy and Action Plan is underway. The need for action plans grew out of the recognition of the national importance of biodiversity, and the ratification by both countries of the Convention on Biological Diversity. The Convention calls for governments to formulate strategies, plans, and programmes for the conservation and sustainable use of biological diversity. To that end, the biodiversity reports produced by St. Lucia and St. Vincent have identified the threats to biodiversity and outlined strategies to address them. The strategies include updating environmental legislation, institutional

strengthening, public participation, education, and the use of economic and financial incentives; the ultimate objective of all of these strategies is to promote sustainable use of biological resources.

Environment/Economy Linkages. Biodiversity as an economic resource and service produces a wide range of economic benefits. They are broadly described as “use” and “non-use” benefits. Use benefits are for the most part self-explanatory, but they are typically broken down into direct and indirect use benefits. Direct use benefits are generally the end products of an ecosystem: timber, fish, or tourism. Indirect benefits are the services or functions provided by an ecosystem: water retention and flood control provided by forests; beach protection and nursery grounds provided by coral reefs. Non-use benefits are the intangible values that individuals or societies may derive from simply knowing that a certain ecosystem exists, whether or not they actually use it. For the purpose of this case study, the following biodiversity valuations focus on use values.

The following table provides valuations for the use benefits of terrestrial and marine ecosystems of St. Lucia and St. Vincent and the Grenadines. The estimates are based on terrestrial spatial data in the country biodiversity reports, marine data from the World Conservation Monitoring Centre (WCMC), and ecosystem and benefit-specific unit values in Costanza *et al.* (1997, 1998). The direct use benefits of food production, raw materials, and tourism are estimated for the rainforest, mangrove, and marine protected area (MPA) classifications. Only food production was estimated for open ocean. Indirect benefits estimated include: disturbance and water supply regulation, erosion control, soil formation, waste treatment (for rainforest and scrub forest); storm protection and nursery function (for mangrove); waste treatment, disturbance regulation, habitat/refugia (for MPA). Base values were derived for 1994 and escalated by 3.5 per cent a year to arrive at representative values for the year 2000. The total annual biodiversity value for St. Vincent amounts to \$266 million; for St. Lucia, \$132 million.

	<u>St. Vincent</u>	<u>St. Lucia</u>
Rainforest	\$ 21 million/year	\$ 33 million/year
Mangrove	<1 million/year	4 million/year
Grasslands/Rangelands	not estimated	<1 million/year
Scrub & Plantation Forest	2 million/year	2 million/year
Total Terrestrial	23 million/year	39 million/year
Marine Protected Areas	79 million/year	13 million/year
Open Ocean	164 million/year	80 million/year
Total Marine	243 million/year	93 million/year
<u>Total Marine and Terrestrial Biodiversity</u>	<u>\$ 266 million/year</u>	<u>\$ 132 million/year</u>

For both countries, almost two-thirds of the total yearly biodiversity value is attributable to the “open ocean” ecosystem. This calculation is based on a per ha per year value of the potential marine catch at average market prices, applied to the EEZ area of each country. Other benefits of the open ocean – gas regulation, nutrient recycling – are omitted.

The valuations provide an indication of the enormous asset value of each country’s biodiversity. With this economic perspective, the threats to these national environmental assets can be considered; this case focuses on marine ecosystems. The biodiversity reports identify various threats to marine ecosystems: uncontrolled development, pollution, soil erosion, unsustainable harvesting of biological resources (fish, invertebrates, marine algae, mangrove trees). The threats persist because of a lack of political commitment to, and financial resources for, environmental

programmes, which then translates into organisational and technical weakness at national and local levels. Lack of environmental awareness among the general public and among enforcement agencies (judiciary, police) is also a problem.

Policy Options. Policies used to manage marine biological resources to date are mainly of the command and control type: gear restrictions, limited entry and season, and zoning that includes the establishment of protected areas. Economic incentive policies are few. An example of the CAC approach is the case of Soufriere Bay and its environs, including the town of Soufriere on St. Lucia. Widespread and human health threatening biodiversity degradation resulted in the creation of the Soufriere Marine Management Area (SMMA). The basis of SMMA's management plan is a zoning agreement. Based on an extensive public process, involving all users, 11 kilometres of coastline were divided into five zones to accommodate all biodiversity uses: marine reserves, fishing priority areas, mooring areas, multiple use areas, recreation areas. The Plan also includes specific fees to be charged to the various users, specifics of required infrastructure and personnel expertise, and systems for monitoring resource use. The Plan was presented to the community in 1994; by 1997 resource use conflicts had escalated to the point that a review of the SMMA was undertaken. The review recommended institutional reforms and a restructuring to permit collected revenues to be recycled within the project area.

In St. Vincent and the Grenadines, the Tobago Cays Marine Park was opened in 1998 when regulations for its use were passed. This area had been previously protected as a forest reserve of biological interest. The regulations for the Park prohibit fishing, damage to flora, fauna, and substrata, polluting, and unauthorised commercial activities. The regulations also provide for a park manager, and other officers for park management and regulation enforcement. A strategy to implement the regulations is not yet developed although a few moorings have been laid, an office has been established, and a Park Warden and Board have been appointed. Implementation suffers from a lack of resources.

Experience to date has suggested that regulatory mechanisms by themselves are inadequate to promote biodiversity. Subsequent to the implementation of reforms at SMMA, greater success is being realised as revenues are now being recycled within a strengthened decentralised authority. The types of fees being collected at SMMA provide an example of how biodiversity "rents" and values can be captured and used beneficially for promoting protection of the asset. Currently, the SMMA directly benefits from a marine reserve dive fee (US\$12 annual or US\$4 daily) and a Coral Conservation Permit for mooring that ranges from US\$10 to US\$25 depending on the size of vessel and duration of stay. Such direct mechanisms are relatively simple to implement and surveys world-wide indicate that those paying such fees are quite willing to do so if the charges directly support conservation and protection efforts. In addition to such fees, biodiversity protection incentives can be motivated through "getting the prices right" in other related sectors. Where rents are being dissipated through open access in forestry and fishery production, for example, there are few incentives to sustainably manage or protect their related habitats.

One outstanding policy issue throughout OECS Member States relates to national property rights associated with biological resources. Bioprospecting, particularly in marine ecosystems, is of growing importance (Ruitenbeek and Cartier 2000), and mechanisms for capturing rents from such activities are typically not now in place. Such mechanisms potentially include joint-venture agreements, royalties, prospecting fees, and similar instruments and have already been implemented in other countries in the Caribbean (e.g., Jamaica). Again, a key objective and advantage of such mechanisms is that they promote sustainable resource use while directly generating revenues.

Conclusions and Lessons. Early experience in these two countries (and especially at the SMMA), coupled with subsequent reforms point to a number of key management lessons locally, which are also pertinent to biodiversity management elsewhere in OECS Member States:

- There is a need for legal and political commitment to environmental objectives, irrespective of the specific management instruments being used. The SMMA management plan did not rest on an adequate legal basis for regulation of the resource.
- There is a need for adaptive management approaches that can deal with issues in a timely and equitable fashion. SMMA's management structure did not provide a mechanism to identify and resolve policy deficiencies.
- Decentralised or local management authority enhances resource values and program implementation. SMMA suffered from poor co-ordination between the Department of Fisheries and the local authority (the Soufriere Foundation).
- Dedicated management, however problematic, can improve resource quality. Evidence suggests that since the establishment of SMMA, marine ecosystem quality has improved, including increases in the stocks of commercial fish.
- There is a need for adequate financial and technical resources. Regulations by themselves do not guaranty compliance; enforcement of regulations was hindered by lack of policing manpower.
- Simple fee systems provide a powerful mechanism for protecting biodiversity. In addition, more complex structures to protect national property rights related to bioprospecting.

Case V – Environmental Assessment

Environmental assessment has many applications, from development permits relating to individual projects, to the assessment of resource management options, to the management of public environmental expenditures such as landfills. Economic analysis is often explicitly linked into such analyses through evaluating the economic consequences of the environmental impacts. In such a context, various costs and benefits are identified with the ultimate goal of improving the allocation of resources. In this case study, we shall focus on waste management, using information relating to St. Vincent to illustrate some key concepts.

General Description. Waste management on St. Vincent must address a wide variety of issues. Household and commercial wastes make up the bulk of the waste stream. Recent concerns have arisen over the disposal of toxic and hazardous substances as storage devices for some chemicals have developed leaks. Sludge from septic systems requires disposal. Beaches and ports are becoming increasingly fouled with sewage run-off and plastics, decreasing amenity values and turning away potential tourist revenue. Garbage clogs drains, increasing cleaning costs and reducing available water supplies through surface water systems. Human health impacts of poor water quality are evident. St. Vincent's waste management strategy aims to rectify a number of these problems.

The strategy is intended to be implemented by the Solid Waste Management Unit (SWMU) within the Central Water and Sewage Authority (CWSA). Its primary focus at the outset is the construction of a sanitary landfill to replace the Arnus Vale dump, although the longer-term mandate – as in other OECS Member States – is to address all solid waste and wastewater services.

Management Objective. Key objectives of the strategy are to provide sanitary waste disposal services for all of St. Vincent, using an institutional structure that does not require government subventions. All activities are to be self-financed through a combination of charge or fee mechanisms.

Environment/Economy Linkages. The primary economic benefit that we shall address here is that associated with human health. This illustrates the important linkage between environmental quality and human health. Evidence in St. Vincent suggests that there is a significant incidence of environmental diseases associated with upper respiratory illnesses and gastro-intestinal upsets.

Epidemiological assessments for St. Vincent show a significant increase in the incidence of environmental illnesses. From 1998 to 1999 alone, gastrointestinal illnesses increased from 1170 cases to 3631 cases. For the year as a whole in 1999, the national incidence of reported environmental illnesses is approximately 1,200 cases per 10,000 of population. Much of this is among children, although approximately 40% is among the productive adult population (ages 16 to 60).

The economic impacts associated with this are significant. Valuation techniques distinguish between direct costs of self-treatment or public treatment within public clinics or hospitals, lost productivity from employment (borne either by individual or employer), lost educational opportunities for children, and lower quality of life because of illness. Methods used to estimate these are based on conventional environmental economic methods using specific country information for St. Vincent (primarily average income and local hospitalisation costs based on public expenditures in the health sector). For all of St. Vincent, for a single year, these are estimated to be as follows:

Direct treatment costs - private individuals	\$ 2.33 million/year
Direct treatment costs - hospitals/clinics	5.18 million/year
Lost economic productivity (adults only)	2.05 million/year
Lost educational opportunities	not estimated
<u>Lost amenity value to individuals</u>	<u>9.56 million/year</u>
Total Cost of Illness	> \$ 19.12 million/year

Policy Options. The annual benefits of addressing proper waste management are thus of the order of \$19 million, excluding other benefits associated with maintaining a clean environment to attract tourists, or reducing the costs of drainage maintenance (estimated at \$1.0 million annually for St. Vincent). To place this in context, the total annual cost of operating the waste management system is likely to be something under \$6 million. Of this, up to about \$3 million can be ear-marked from environmental levies (similar to those enumerated in Table 3), leaving \$3 million to be collected from users of the service. The benefit analysis shows, first and foremost, that individuals should be willing to pay this amount if they are aware of the beneficial connection between waste management and human health. In that event, direct charges through tipping fees, or even through utility surcharges (e.g. energy bills), are economically warranted. The major constraint to this approach is that, unless the programme includes a substantial public awareness component (and even if it does), this connection is often not made. It may then be more appropriate to raise the revenues through general fiscal instruments and redistribute them through a subvention to the waste management authority. In the case of St. Vincent, the potential direct savings in greater productivity and lower public hospitalisation expenses will more than offset this subvention over the long term.

Conclusions and Lessons. In a more generalised sense, this case study illustrates the connection between environmental degradation and human health, and how institutional and educational elements may influence the policy choice. If user charges are pursued, they must be implemented concurrently with a substantial awareness building and information campaign. The case also demonstrates that different countries may, in fact, pursue quite different approaches to charging without necessarily affecting competitiveness or creating distortions. In this instance, if a subvention were to be pursued, it may be regarded over the long term as an expenditure shift away from public health expenditures towards environmental management expenditures. We are often taught that “prevention is better than treatment,” and this is a case in point.

Case VI – Sustainable Management of Natural Resources

The issue of sustainability is pervasive throughout the sustainable development literature. Historically, sustainable management of natural resources generally involved maximising economic returns to a given resource. Fishery and forestry economics, for example, focused on establishing optimal levels of harvesting given any set of costs and prices, with some specified conditions of growth in forests or fishery stocks. More recently, the discussion around sustainable development acknowledges the interdependence that such resources have with other systems (e.g., agricultural systems in forestry, coral reef systems for coastal and artisanal fisheries). The optimisation problem is thus expanded. Moreover, through lessons hard learned, it is clear that presumed “renewable” resource stocks are not in fact renewable if they are harvested beyond some critical point; tropical deforestation and fishery collapses around the world now attest to that reality. While it is beyond the scope of this work to consider all of the issues involved in sustainable fishery and forestry management, we shall here look at one specific “environmental/economic” linkage: rent capture.

General Description. Although fisheries and forestry are important natural resources, they still play a relatively minor role in most economies of OECS Member States. Typically, fishery contribution to GDP is less than 3%, and forestry’s contribution is even less. Forests and fish, however, remain an important part of the functioning environment and provide services that extend beyond direct economic production. They also serve as important sources of livelihood in areas of high unemployment. To date, however, most efforts at fishery and forestry management have been driven by employment generation, rather than economic and environmental sustainability. Various government plans do, however, call for greater attention to be paid to sustainable harvesting.

Management Objective. Simply stated, the management objective associated with sustainable management of a renewable resource is to maximise economic returns without threatening the ability or opportunity for future generations to enjoy similar returns.

Environment/Economy Linkages. A key indicator of sustainability is “rent capture”. Rent capture refers to the amount of economic rent that is captured by existing management mechanisms. Resource rents include profits to industry and individuals, as well as returns to government in the form of licenses, fees or royalties. Rent capture is an important indicator because, if rents are zero or negative, there is some likelihood that the resource is being managed unsustainably and, indeed, is being over-exploited. Zero rent capture occurs when users harvest a resource right to the economic margin, dissipating all profits and values. Costs and revenues from resource harvesting are equal, and fee, license and royalty income are inadequate to cover routine operational monitoring, enforcement and administration. From an analytical perspective, we ask, “What evidence is there of positive rent capture?” At this time, all indications are that rents are being

dissipated and that no net revenues or economic value are accruing because of inadequate forestry or fishery management. The following ratios are based on currently available information:

<u>Government revenue as a proportion of total resource value</u>	
Forestry - St. Lucia	25.46%
Forestry - St. Vincent	1.11%
Fisheries - St. Vincent	0.93%
Fisheries - Antigua	0.31%
<u>Government revenue as a percentage of management expenditures</u>	
Forestry - St. Lucia	21.4%
Forestry - St. Vincent	2.3%
Fishery - St. Vincent	12.7%
Fisheries - Antigua	<12%

With the exception of St. Lucia's forestry sector, there are strong indications that resources are being under-priced. In that instance, however, the major source of income in ST. Lucia is associated with "forest tours", indicating that fees from this recreational activity are being used positively as a sustainable means for rent collection.

Policy Options. To date, most of the interventions in these sectors have been regulatory in nature and have not substantially used fee or royalty structures to extract resource rents. While harvesting of forest products is not being actively pursued, as management favours protective measures, fishery management is being directed now towards increased intensification of fishing effort as harbour investments and support for fishing fleets is being promoted. While this may increase the total effort, the impact that this will have on resource sustainability remains to be seen. Policy options that could complement such investments and development could include: (i) individual tradable quotas for fishing – referred to generally as ITQs – with license fees attached to quotas to generate revenue; (ii) gross revenue taxation to limit fishing at the margin. Either of these mechanisms would have a combined incentive and revenue impact, promoting resource sustainability and economic development. Evidence elsewhere generally suggests that governments should be able to extract between 30%-50% of available rents of a well managed sustainable resource.

Conclusions and Lessons. The primary intervention mechanisms that are evident for renewable resources involve tenure security, which is being addressed across the OECS in the case of forestry. For fisheries, however, management options are currently focused on regulatory efforts and scope exists for increased reliance on market mechanisms such as ITQs or direct resource taxation.

Summary

The case studies demonstrate that, within small island systems, the effects of a given policy intervention are likely to have the following attributes:

1. Impacts will occur in more than one economic sector or activity and will moreover be manifest in multiple environmental goods or services. This again underlines the need for addressing such interventions in an integrated framework such as Island Systems Management.
2. The economic impacts of policy interventions are likely to have both a revenue impact and an incentive effect. This indicates that policies intended to support sustainable behaviour will also have a non-neutral impact on revenues; such revenues can be used in a variety of ways:

- institutional strengthening, provision of services, or revenue shifting in a manner that other revenue generating mechanisms receive less emphasis.
3. The use of earmarked revenues provides an important focal point for decentralising decision-making authority and provides greater incentives to local resource users to manage resources sustainably. It also provides necessary funding for capacity development.
 4. Correcting current pricing distortions can lead to improved management of resources. This is particularly true where rents are currently not being realised.
 5. Economic policy interventions can be designed as “precautionary” instruments within an adaptive management framework. Many permit greater flexibility than would strict regulatory mechanisms.
 6. The cost of correcting environmental damage after the fact is many times more costly than preventing damage and maintaining adequate levels of environmental quality in the first place. Moreover, in some instances restorative costs are effectively infinite where damages are irreversible. The application of economic instruments is an important and cost saving tool in this regard.
 7. Institutional strengthening is a co-requisite to the successful implementation of any policy intervention; such capacity development should go hand-in-hand with the implementation process so that revenues generated through implementation can concurrently fund capacity development.

5. Benefits of Action

Introduction

This section provides a broad monetary assessment of the economic benefits associated with policy reforms that protect key environmental resources. It does not identify specific reforms, as the methodology used here is one that assumes that, in the absence of effective reforms, general environmental degradation will persist in a manner that threatens key economic sectors. To this extent, the benefits of action may also be seen as the costs of inaction: “What would be the impacts of not pursuing appropriate policy interventions?” The analysis in this section extrapolates to *all* OECS Member States using benefit transfer techniques and basic demographic and biophysical indicators that are available for all of the countries. It focuses on the types of economic services that are amenable to such benefit transfer techniques, providing a lower bound estimate of the benefits of policy action (and costs of policy inaction).

Benefit transfer techniques are used in cases where inadequate time or information exists to conduct in-depth studies across all environmental resources. Essentially, benefit values are taken from a specific detailed study site and extrapolated to a broader population or area. These techniques have become an accepted method of environmental economic analysis provided that the intent of the analysis is to communicate the relative economic importance of key environmental functions. Benefit transfer is most reliable when the estimates are transferred between like countries or like sites; a useful practical methodological text is that provided by the Asian Development Bank (1996). Benefit transfer figures are also often based on those developed by Costanza *et al.* (1997, 1998). Two electronically searchable benefit transfer sites are available. The first of these sites is maintained by Environment Canada and is entitled “EVRI: Environmental Valuation Reference Inventory.” At the end of 1998 it contained about 850 references, primarily relating to the valuation of freshwater-related issues. A second site is spearheaded by the New South Wales Government in Australia (entitled ENVALUE).³

For the estimates conducted here, we rely primarily on local information and values, and extrapolate values based on key demographic, economic and biophysical characteristics of the countries analysed. Summary tables with selected baseline information for the OECS Members States are provided in the Annex. The techniques used here will consistently under-estimate benefits and should therefore be seen as conservative estimates to the extent that actual environmental damages (from inaction) may in fact be greater than those shown here. A summary of the results is presented in Table 5.

“WHAT difference does it make
what you have? What you do not
have amounts to much more.”

Seneca.
Roman writer, philosopher,
statesman. ca. 65 AD.

³ These electronic sites are located at <<http://www.evri.ec.gc.ca/EVRI/>> and at <<http://www.epa.nsw.gov.au/envalue/StudyCnt.asp>>. Registration fees are required for the Canadian site; the New South Wales site is free and is publicly accessible.

Table 5
Estimates of the Benefits of Maintaining Environmental Quality in OECS Member States

Sector	Benefits of Policy Action (/year)
Renewable Resource Values	
- Forestry	\$ 8 million
- Fishery	36 million
Biodiversity Values	
- Terrestrial	245 million
- Coastal and Marine (excludes EEZ)*	793 million
Beach and Near-shore land values	187 million
Sustainable Tourism	214 million
Human Health	131 million
Total of Items Enumerated	\$ 1,614 million
* This component includes only mangroves and those marine areas currently inside Marine Protected Areas. Open ocean within the EEZ is excluded.	

Valuation of Benefits

Maintaining Renewable Resource Values. Summaries of forestry and fishery productivity were developed for all OECS Member States based on government sectoral statistics. If well managed, it is estimated that forestry resources could yield net economic benefit values of \$8 million annually and fisheries could yield approximately \$36 million annually. It should be recognised that these estimates represent net values, implying that they are the economic profit remaining after deduction of input costs (labour, materials, and return on capital), but excluding transfer payments such as taxes and government fees. For this reason, they are considerably less than typical GDP figures that accrue to these sectors. The values imply that, even if the resources are managed sustainably, they will not contribute a significant amount to total economic production. Nonetheless, it provides additional grounds for proper management of related resources that protect these values (e.g., through watershed management that protects near shore fishery).

Maintaining Biodiversity Values at Risk. As noted in Case IV, biodiversity values can represent a significant component of total economic value. In the case of OECS Member States, the total terrestrial values are of the order of \$245 million annually, while marine values are in turn more than three times this amount. In preparing this estimate, it should be noted that a number of potential “biodiversity values” have been deliberately underestimated. All biodiversity values associated with open functions within the EEZ, including food production, nutrient recycling, climate regulation, and waste processing have been omitted. This is primarily because the functions are currently not under any potential threat (although the food production function for open oceans within OECS Member States’ territorial seas is estimated to be approximately \$1.1 billion annually.) The marine biodiversity, in this case, focuses entirely on mangrove areas and designated marine protected areas (MPAs).

Protecting Beach and Near-shore Land Values. Beach and near shore land values are those at risk from a combination of vegetation loss, sand mining, disregard for development setbacks, and offshore fringing reef degradation. An inventory of coastal land areas was used to determine the land values at risk for all OECS Member States, property values for such areas were taken to be an average of \$50/ft² for Antigua and BVI and \$10/ft² elsewhere. The coastal land strip that was evaluated corresponds to a buffer zone of 20 meters, representing the minimum usual setback that might required to mitigate storm and related impacts. It is noted that in some cases, setbacks would need to be greater, and hence this may represent an underestimate of the land protected. Figures were annualised on the basis of 5%/year real returns to capital. As a consequence, the total annualised value of beach protection arising from effective protection efforts would be approximately \$190 million annually.

Sustaining Tourism Values. The method used to determine sustainable tourism values relies on an assessment of the net direct benefits from tourism. Although tourism expenditures are substantial within OECS Member States, the costs of delivering goods and services to the sector is also substantial. To date, no thorough cost analysis is available to assess the net benefits of tourism. We therefore use standardised estimates available from World Tourism Organisation studies and assessments, that show sustainable tourism margins to be typically of the order of 5-10% of total tourism expenditures. The margin ratios are lowest in countries that have high subsidies for energy and other inputs, while they are highest in areas where competitive markets prevail and where inputs to the industry are unsubsidised. Conditions in most OECS Member States fall in between these extremes; markets for tourism have been liberalised but not all inputs are delivered at full social costs (e.g., waste management services and water remain subsidised to some degree). The assessment undertaken for this study is reported at the mid-point of the estimating range: a 7.5% margin. This leads to a total annualised value of approximately \$214 million attributable to sustainable tourism in OECS Member States as a whole.

Improving Human Health. The analysis of human health impacts and benefits builds on that conducted in Case V, which relied on information specific to St. Vincent showing a growing incidence of environmental illnesses. Environmental illnesses are documented to be on the increase in other countries as well (PAHO). While incidence is very low or undocumented in some States, the general pattern is that environmental illnesses are of the same order of magnitude as that found in St. Vincent (1,200 cases per 10,000 population). The highest that was noticed is, in fact, in Antigua, which reports environmental illnesses at a level approaching 1,500 cases per 10,000 population annually. This relatively higher amount is partially attributed to a greater access to health care facilities in Antigua, and “unreported” cases are thus potentially lower here than they are elsewhere (typically, unreported “self-treated” cases are equal to or slightly higher than reported cases). For the purposes of this analysis, a country-by-country estimate was conducted using local wage rates and hospitalisation costs, assuming a typical incidence of environmental illnesses of 1,000 cases per 10,000 population. Also, the analysis excluded Anguilla, BVI, and Montserrat. The result indicated that the total benefit to improvements in human health within this sample would be approximately \$131 million a year; of this, 62% is a direct benefit to the individual through improved quality of life and lower medical costs, 27% is a direct benefit to the public purse in terms of lower medical costs, and the remaining 11% represents a general benefit to the economy for improved worker productivity. Again, the values exclude the longer term benefits of reduced morbidity among school age children.

Summary

Table 5 thus illustrates that the benefits of implementing proper environmental management within OECS Member States is of the order of \$1,614 million annually. This represents approximately 25% of the collective GNP (\$6.55 billion/year) of the OECS. It should be noted that just over \$1 billion of these benefits are associated with potential biodiversity values, many of which currently can not be captured. Nonetheless, the other values (renewable resources, beach values, sustainable tourism, and human health) constitute readily realised benefits of \$576 million (8.8% of GNP).

6. Recommendations

Based on the foregoing analyses and observations, this section provides a summary set of recommendations and priorities for action. It commences with a discussion of three over-arching strategies relating to: (i) environmental resource pricing; (ii) a reorientation of revenues directly to environmental expenditures; and, (iii) systematic institutional strengthening and capacity development in priority areas. Specific priority policies, mechanisms and programmes are identified and elaborated.

“GOVERNMENT has no other end but the preservation of Property.”

John Locke. English philosopher, 1681.

Opening Comment – Country Priorities and Harmonisation

One characteristic of environmental problems and issues is that they tend to differ in their local dimensions. Whereas a banana grown in Dominica is not much different from a banana grown in St. Lucia, the impacts of watershed degradation, biodiversity loss, or beach erosion can vary dramatically from one country to the next. This implies that different countries are likely to have different environmental priorities, and they will no doubt have different regulatory and related mechanisms that may be preferred. Moreover, concepts such as adaptive management and Island Systems Management, which are key components of environmental management, are founded on the idea that local concerns and decision-making are paramount in sustainable resource management. These realities have two quite unrelated general implications for the recommendations that arise from this study.

First, at this stage, the recommendations documented here should be seen as ones that guide general policy directions, rather than specific policies. The level of analysis undertaken to date has been for the region as a whole, with specific reference to some OECS Member States. Individual countries will need to glean what they can from these, and build on them to fit local conditions and priorities.

Second, and perhaps more important, the issue of economic policy reform for environmental management raises some critical questions relating to *harmonisation*. The OECS was founded partially to promote the harmonisation of policies, such that individual Member States would not be unduly disadvantaged by the actions of other Member States, and such that countries could learn from each other through building similar institutions and structures. Harmonisation in that context provides resiliency, equity and efficiency. But in the realm of environmental management, harmonisation may also undermine local efforts to achieve sustainability. One can imagine, for example, cases where common policies in effect create burdens and constraints locally that would not be consistent with the philosophy of “locally driven adaptive management.” Moreover, lessons from elsewhere have shown that the absence of harmonisation does not necessarily lead to massive policy distortions of the sort that might arise from, say, un-harmonised banana marketing programmes. In fact, even where harmonisation was initially a policy goal and was subsequently abandoned, no ill economic effects have been documented. What this implies at a practical level is that some agreement or understanding must be reached on what, in fact, harmonisation implies within the context of environmental/economic policy. The position recommended here is that harmonisation *can and should exist* at a broad policy strategy level that entrenches, for example, the principles that natural and environmental resources should not have a zero price, that environmental resource revenues should be preferentially ear-marked for beneficial environmental initiatives. The

concept of harmonisation should not, however, necessarily be extended to all instruments, charges, levies, or similar taxation and regulatory mechanisms that might be available. Such specific instruments should be selected and designed consistent with local conditions in any given country, and within any specific ecosystem or management unit within a country.

General Strategies

It is recommended that three over-arching strategies be adopted to guide environmental/economic policy setting in Member States of the OECS. The strategies and their associated objectives are:

1. **Resource Pricing Strategy.** Many environmental goods and services are currently un-priced or under-priced. This results in perverse incentives that lead to resource mismanagement. Sand-mining, over-fishing, deforestation, and over-exploitation of biodiversity are all consequences of improper resource pricing. The under-pricing of such goods and services in effect constitutes an implicit subsidy by Government to resource users. The commitment under this strategy would be to systematically remove such hidden subsidies by seeking to introduce mechanisms and instruments (including regulatory or market-based instruments) that send proper price signals to resource users. Simply stated, the objective is to “get the prices right” for natural resources and environmental goods and services. A secondary component of this strategy is to increase resource rents that are available to society, either through greater profit shares to resource users or through greater financial returns to the public purse; this requires minimally that some of the resource pricing mechanisms do in fact generate revenue for public coffers.
2. **Revenue Earmarking Strategy.** The revenues that are currently generated by existing and proposed environmental levies or taxes often end up in central coffers and are not redirected or re-invested in maintaining the critical environmental goods or services that generated such revenues in the first place. As a consequence, collection of revenues is often difficult, institutions vested with the responsibility for resource management are often under-funded, and the ability to use such revenues in a constructive decentralised adaptive framework is absent. Consequently, resources continue to degrade, institutions become weaker, and revenue sustainability is itself undermined. The commitment under this strategy would be to systematically reorient revenue streams to make them available for financing supportive and related environmental initiatives. For example, receipts from nature trails would be re-invested for biodiversity conservation. Simply stated, the objective is to “improve effectiveness of expenditures through targeting revenues and funds to specific environmental initiatives.”
3. **Institutional Strengthening Strategy.** A clear lesson from elsewhere and from within OECS Member States is that environmental/economic policies and instruments can not be implemented in an institutional vacuum. It was originally widely presumed that some types of mechanisms, those relying on market structures, require less institutional support than do regulatory (command and control) approaches. Current evidence suggests, however, that regulatory and market-based approaches go hand-in-hand for maximum effectiveness and that solid institutional foundations are a key element of implementation. The commitment under this strategy, therefore, is to provide support in principle and in substance to institutional strengthening and capacity development in the area of environmental/economic policy design and implementation. The commitment specifically recognises that such strengthening and development is a *co-requisite* (as opposed to a prerequisite or an outcome) of policy design and implementation. This is because the very revenue-generating nature of many of the economic instruments is such that it is capable of contributing to such

strengthening. Simply stated, the objective is to “develop adaptive decentralised sustainable institutions – in a ‘learning through doing’ context – that can assist in realising broader economic and environmental objectives.”

General Recommendations regarding Pricing and Earmarking in Priority Sectors

This study has shown that the resource pricing and earmarking strategies referred to above can be applied to different sectors and, as noted, each country should be adopting such strategies within the context of their own national priorities. Many Member States have already implicitly adopted such strategies for waste management, for example, within the context of the OECS Solid and Ship-Generated Waste Management Project. Such strategies may equally well be applied on locally important issues such as hydrocarbon wastes and emissions in BVI, leaded petrol in St. Vincent, forestry management in St. Lucia, sand pricing in Antigua and Barbuda and elsewhere, fishery development throughout the OECS, and biodiversity protection in countries that have completed their biodiversity strategies. Also, it is noted that priorities in some countries are not sector specific; but focus on specific areas or locations. The Buccament Valley on St. Vincent is a case in point.

From a pragmatic perspective, it is therefore recommended that the commitments to the pricing and earmarking strategies be supported on a country-by-country basis within the context of comprehensive planning exercises that are currently in process. This includes, for example, National Environmental Action Plans such as those undertaken in St. Vincent, National Environmental Management Strategies (NEMS) or Integrated Development Plans (IDPs) such as those being pursued in Montserrat, Anguilla and St. Lucia, or other nation-wide planning exercises such as the National Physical Development Plan being pursued and implemented in Antigua and Barbuda. To complement this, the commitments may also be entrenched in local area development plans.

General Recommendations regarding Institutional Issues

Institutional strengthening as an over-arching strategy has a number of related components that merit elaboration. These are as follows.

1. Explicit Policy Supporting Fiscal Decentralisation. Institutional strengthening does not necessarily imply the creation of new institutions nor the bolstering of central authorities. Lessons from institutional economics as applied to environmental management show that strengthening is best achieved in existing *decentralised* institutions. In rare circumstances will a new entity be formed (usually such a new entity is for co-ordination purposes only in a complex watershed or coastal system). To facilitate such strengthening, a policy of fiscal decentralisation (consistent with the revenue ear-marking strategy) delegates revenue collection and spending responsibility to that same decentralised authority. Legislative changes may be required to support this (as was the case with the SMMA in St. Lucia and Nelson’s Dockyard National Park in Antigua). In addition, human capacity development in the form of management and technical training and support is inevitably required as the decentralised institutions would, previously, have had less access to such development.
2. Explicit Policy Supporting Precautionary and Adaptive Approaches. Environmental change is fraught with uncertainty. Whether it is associated with the fickleness of hurricane tracks, the complexity of interacting pollutants, or the vagaries of social unrest brought on by sudden disruptions, effective management of environmental change requires an adaptive approach.

Moreover, planners and managers faced with irreversible consequences to their actions must adopt a precautionary approach that takes into account not just the likely outcomes, but also the potential “worst-case” consequences. Precautionary, adaptive and innovative management is therefore an important component of implementing environmental/economic instruments. Unfortunately, incentive structures in many institutions are inconsistent with such policy directions. Institutions often reward consistency, rather than innovation. Advancement is often a matter of seniority rather than merit. And resources are usually made available based on historical usage rather than future needs; institutions thus gain momentum and resist change. Short of scrapping such institutions and starting afresh (a tactic used in some jurisdictions), there are no ready solutions to overcome these constraints. As a start, however, policy-makers must become aware that environmental management requires adaptive models and institutional strengthening can be directed: (i) preferentially to smaller authorities less encumbered by historical momentum; (ii) to institutional reforms that recognise and reward (or minimally do not punish) innovation; and, (iii) to capacity development and training in the fields of adaptive management and precautionary decision-making.

3. Explicit Policy Supporting Public Education and Awareness. The analyses showed that the effectiveness of many revenue collection schemes depends on taking advantage of somebody’s “willingness-to-Pay” (WTP) for an environmental good or service. In the case of tourists, this WTP is often not in question and the effectiveness of tourist levies and user charges attest to this. For domestic residents, however, the picture is different. People are generally willing to pay for garbage collection, clean water, and related sanitation services *if* they are aware of the beneficial health and other consequences, and if they are assured that the amounts they pay in fact are directed to appropriate environmental initiatives. Absent such knowledge or assurances, they are willing to pay less, pay nothing at all or, in extreme circumstances, lobby fiercely and vocally to oppose any such reforms. Public awareness and environmental sensitisation is, therefore, a key component of the effectiveness of many economic instruments, and of the institutions that are strengthened by the collection of fees and charges. Policy and funding support must, therefore, be afforded to such campaigns and awareness building in parallel with general institutional strengthening and environmental/economic policy development.

Specific Recommendations regarding Selection of Instruments

This study has shown that a wide range of instruments is available from which to draw specific policies. It is anticipated that user charges and fees will continue to be an obvious target for revenue collection, and such a priority is for the most part justified because of administrative efficiencies, incentive effects, and the ability to use such revenues for general institutional support. Some of these will potentially generate revenue surplus to local resource management needs; any such surplus can accrue to central consolidated funds. In addition, however, it is recommended that explicit policy support be given to three other types of instruments that might otherwise be neglected. All of these instruments have seen some usage in OECS Member States in different contexts, and all are primarily “revenue-neutral” schemes from the perspective of implementing States. These are (in no particular order of priority):

- *Voluntary schemes.* Voluntary mechanisms involve programmes such as green certification in the hospitality industry, organic growing initiatives, and voluntary waste reduction schemes under ISO 9000 or ISO 14000 for industrial manufacturers. Such programs have, to date, witnessed limited implementation. Policies supporting such initiatives would involve,

primarily, casting a responsible agency in a facilitating role to allow stakeholders to share experiences and develop programmes.

- *Recycling and deposit/refund initiatives.* All countries in the OECS have had experience with such schemes but they are in various stages of suspension or under-use. In some cases this is because voluntary programmes have been abandoned, in others it is because there are no facilities for recycling, while elsewhere it is because of lack of financial incentives for recycling. In most countries the objective to “refuse, reduce, re-use, or recycle” is already a component of their waste management strategy, but this can be further bolstered by linking this to economic incentives.
- *Performance bonds.* The use of performance guaranties or bonds as a component of development permits is already in place in many Member States. To date, these have not been used for environmental initiatives. Given that administrative procedures are already in place, however, adding this dimension to such permits may be less complicated than implementing other administrative controls.

Specific Recommendations regarding Institutional Issues and Capacity Development

Although institutional strengthening is an underlying theme of environmental/economic policy implementation, a few specific initiatives should receive immediate policy support. These are:

- *Policy support for watershed and coastal zone management.* The interconnections between environmental goods and services, human activities, and environmental quality are most pronounced within the ecological boundaries of a watershed or a coastal strip. These boundaries are often at odds with local political or administrative boundaries. Such areas could be preferentially designated for institutional strengthening or decentralisation of authority, to facilitate management of local resource issues.
- *Information and green accounting.* Information sources for environmental and economic planning are scattered and not well-developed or co-ordinated. Over the past 15 years, the United Nations Statistical Office has developed programs of “green accounting” that can sit alongside a country’s national economic accounts as satellite accounts or, in some cases, as integrated components of national reporting systems. In addition to providing a basis for reporting and monitoring requirements under international conventions, such information provides a consistent long-term source of information critical for environmental/economic planning and decision-making.⁴ It is therefore recommended that explicit institutional strengthening be provided to the relevant central statistical agencies or departments to commence such green accounting exercises using UNSO procedures and guidelines.
- *Role of protected areas.* Terrestrial and marine biodiversity were identified as among the highest valued environmental/economic assets in the OECS, although they have among the lowest ratio of “captured” benefits. A strong policy commitment must be made to the role of protected areas in conserving biodiversity values. The nature of this policy support will differ from country to country.

⁴ This study included an informal audit of these systems in three OECS Member States. In no case had such accounts been developed or pursued, although there was – in one instance – knowledge that such procedures existed.

- *Green budget reform.* Recognition should be given to the fact that increased reliance on revenues and rents from environmental goods and services will, in time, generate a fiscal dividend in the form of surplus revenues. Such a tax shift has already been noted in countries where such reforms were initiated a decade ago. The fiscal dividend has permitted modest reduction of other taxes, such as payroll taxes, income taxes, property taxes, or capital taxes. Such a “tax shift” is a key long-term feature of many environmental/economic policy initiatives, and this fact is an important message that can be instrumental in re-establishing the support of detractors from various interest groups. More specifically, it requires that central finance departments or treasuries should also be involved in any institutional strengthening and capacity development initiative; it will often be their responsibility to identify “tax shifting” opportunities.

Recommended Near-term Steps

The recommendations provided above pertain primarily at a general level to any and all Member States of the OECS. Specific recommendations— such as those associated with the adoption of the three over-arching strategies – can be an immediate policy. But it should be recognised that much of the work involved with some of the specific policy and instrument identification and implementation tasks still needs to be done, and this is best done at a country level. To achieve this, it is recommended that the “next steps” focus to a large degree on work done by and in each individual Member State. To that end, the following represent the minimum near-term steps that need to be taken within each country:

- general endorsement of policy recommendations enumerated above, with an emphasis on the three over-arching strategies.
- designation of a central responsible authority within each Member State, responsible for overseeing and monitoring progress related to the implementation of “environmental/economic policy initiatives”. While there may be a tendency to involve Environment Ministries in this task, it is strongly recommended that the responsible authority be one with a well-established economic development and financial monitoring mandate. This typically will be the Ministry of Finance, the Treasury, or a Central Planning Agency or Department.
- under the guidance of this responsible authority, a full inventory should be made of all environmental initiatives within the country. This involves an enumeration along the lines conducted for this study, identifying revenue and expenditure measures, as well as other measures such as voluntary programs. The purpose of this is to use it as a benchmark for future reforms, while also involving many public, private and NGO stakeholders in the process.
- under the guidance of the responsible authority, identification of priority environmental/economic initiatives, along with potential for tax shifting. This will be informed by the above inventory as well as any national planning initiatives that set environmental and related priorities.
- independent of the above tasks, a separate initiative can be launched that provides explicit facilitative support to voluntary certification programs for private sector associations.

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Statistical Annexes

Attached tables provide general background indicators and information on Member States of the OECS.

Annex Table 1. Income and Population Summary for OECS Member States

Annex Table 2. Selected Sector Data for OECS Member States

Annex Table 1. Income and Population Summary for OECS Member States

	Real GDP 1997 EC\$ mil	Population mid Year 1997	Real GDP 1997 US\$ mil	Real Per Capita 1997 EC\$	Real Per Capita 1997 US\$	Real GDP growth rate (avg growth 96&97)	Population Growth (Avg 1996 & 1997)	Real GDP 2000 EC\$ mil	Population 2000	Real Per Capita 2000 EC\$	Real Per Capita 2000 US\$	Area km ²	Pop Density /km ²
Anguilla	162	14328	60	11316	4191	6.37	3.16	195	15730	12404	4594	91	173
Antigua & Barbuda	1093	69890	405	15645	5795	5.54	0.36	1285	70648	18195	6739	442	160
British Virgin Islands	1467	19864	543	73848	27351	4.30	1.96	1664	21055	79050	29278	153	138
Dominica	431	75527	159	5701	2112	2.45	-1.41	463	72377	6397	2369	750	97
Grenada	568	99500	210	5708	2114	3.85	0.87	636	102120	6228	2307	344	297
Montserrat	76	7750	28	9743	3609	1.00	0.21	78	7799	9975	3695	102	76
St. Kitts & Nevis	492	40740	182	12064	4468	6.08	1.34	587	42400	13836	5124	267	159
St. Lucia	1056	149621	391	7058	2614	0.69	1.09	1078	154567	6973	2583	616	251
St. Vincent & the Grenadines	536	111224	198	4816	1784	1.76	0.57	564	113137	4989	1848	389	291

Annex Table 2. Selected Sector Data for OECS Member States

	Tourism Growth 1994/1990	Tourism Exp. 1997 Current EC\$ mil	GDP 1997 Current EC\$ mil	Tourism Exp. % GDP 1997	Hotel & Restaurant % of 1997 GDP	Manufacturing % of 1997 GDP	Agriculture % of 1997 GDP	Real GDP 1997 EC\$ mil	Tourism Exp 1997 Real EC\$ mil	Agriculture 1997 GDP EC\$ mil	Hotel & Restaurant 1997 GDP EC\$ mil	Manufacturing 1997 GDP EC\$ mil
Anguilla	40	162.99	237.54	69	34	1	3.81	162	111	6	55	1
Antigua & Barbuda	28	749.31	1576.02	48	15	2	3.57	1093	520	39	167	27
British Virgin Islands	50	n.a.	n.a.	65	13	1	1.8	1467	953	26	183	16
Dominica	25	106.78	655.30	16	3	6	20.3	431	70	87	11	26
Grenada	33	219.05	875.96	25	8	7	9.47	568	142	54	45	40
Montserrat	14	14.65	108.53	13	1	4	1.31	76	10	1	1	3
St. Kitts & Nevis	24	195.59	724.13	27	7	12	6.97	492	133	34	35	57
St. Lucia	58	683.91	1541.59	44	13	6	6.93	1056	468	73	142	67
St. Vincent & the Grenadines	2	190.78	768.50	25	3	8	10.8	536	133	58	14	45
Total		2323	6488	43	11	5	6	5880	2541	379	651	284