***Case IV – Biodiversity Protection from*** Economic Opportunities Associated with the Environment

in the Member States of the

Organisation of Eastern Caribbean States (OECS)

Policy Paper

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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

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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.

St. Vincent St. Lucia

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

Total Marine and Terrestrial Biodiversity $ 266 million/year $ 132 million/year

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

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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 form 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 worldwide 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.

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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.