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Environmental Economics for Integrated Coastal Area Management: Valuation Methods and Policy Instruments

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Note: This document was written by Thomas A. Grigalunas and James J. Opaluch, Professors in the Department of Resource Economics at the University of Rhode Island (URI), Gardner M. Brown, Jr., Professor of Economics at the University of Washington and Jerry Diamantides, an Instructor in Economics and a Ph. D. candidate in the Department of Resource Economics at URI, under the guidance of the Oceans and Coastal Areas Programme Activity Centre (OCA/PAC) of UNEP. The financial support for the preparation and review of the document was provided by OCA/PAC through Project FP/ 5101/90-03-2218.

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Degradation of the marine environment can result from a wide range of sources. Land-based sources contribute 70% of marine pollution, while marine transport and dumping at sea contribute 10% each. Degradation of the marine environment can also result from a wide range of activities on land. Human settlements, land use, construction of coastal infrastructure, agriculture, forestry, urban development, tourism and industry can affect the marine environment. Coastal erosion and siltation are also of particular concern. Furthermore, coastal erosion is one of the main issues for many developing states, including small islands, in the context of long term sea-level rise. All kinds of marine and coastal degradation require specific actions to control or reduce their social impacts. These actions are costly, and the measurement of costs and social benefits is a very important component of the decision process to prepare national environmental policies for sustainable development and to formulate financial projects to be submitted to relevant development banks and financial institutions concerned with the welfare of human beings.

The United Conference on Environment and Development (UNCED, 3-14 June 1992) calls upon countries to undertake activities to meet three fundamental objectives, reflected in Agenda 21, Chapter 8: a) to incorporate environmental costs in the decisions of producers and consumers, to reverse the tendency to treat the environment as a "free good", and to pass these costs on to other parts of society, other countries, or future generations; b) to move more fully towards integration of social costs and environmental costs into economic activities, so that prices will appropriately reflect the relative scarcity and total value of resources and contribute towards the prevention of environmental degradation; and c) to include, whenever appropriate, the use of market principles in the framing of economic instruments and policies to pursue sustainable development.

UNCED recognized also the specifics of the marine environment in Chaper 17 of Agenda 21, and the need to promote the Integrated Management for the Sustainable Development of Coastal Areas, and the Sustainable Use and Conservation of Marine Living Resources. In particular, the necessity to provide for an integrated policy and decision-making process, to promote the development and application of methods that reflect changes in value resulting from uses of coastal and marine areas, including pollution, marine crossion, loss of resources and habitat destruction and the development of bioeconomic models for the sustainable use and protection of marine living resources. In addition, to strengthen the protection of the marine environment, UNCED recognized the necessity to develop economic incentives, where appropriate, to apply clean technologies and other means consistent with the internalization of environmental costs, such as the "polluter pays" principle, so as to avoid degradation of the marine environment.

The UNEP Governing Council in its decision 17/33 of 21 May 1993 authorized the Executive Director to implement *inter alia*, the following sub-programmes: Environmental Management of all Kind of Seas and Coastal Area Management (Sub-programme 4), and Environmental Economics, Accounting and Management Tools (Sub-programme 6).

The present document, "Environmental Economics for Integrated Coastal Area Management: Valuation Methods and Policy Instruments", fits in the overall strategies designed to implement both above-mentioned sub-programmes, and particularly their following components on: Economic Policy Instruments, to examine the status of current research **Resource Valuation**, to indentify gaps in existing knowledge, by providing developping countries with guidance for decision-making based on economic rationale and principles for environmentally sound and sustainable development; and, to explore how the application of valuation techniques will help ascertain environmental costs and in turn enable developed and developing countries to fulfil their global environmental responsabilities, and to estimate the costs of making the transition to environmentally sound and sustainable development; **Integrated Coastal Area Planning and Management (ICAM)**, to formulate a technical framework strategy for integrated coastal area planning and management with special emphasis on its economic and environmental benefits; **Land-Based Sources of Pollution**, to develop a common methodology to determine the range of cost-effectiveness of protection measures and their overall economic benefits for coastal areas; and **Marine Living Resources**, to formulate integrated management plans for the protection and conservation of coastal and marine ecosystems, critical habitats and/or their living resources, based on ecological, social and economic criteria.

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The Oceans and Coastal Areas Programme Activity Centre of UNEP (OCA/PAC) in cooperation with Environment and Economic Unit (UNEP/EEU) initiated in 1993 a programme component on Environmental Economics for Integrated Coastal Area Management to be implemented at the regional and national levels, through the **Regional Action Plans for the Protection and Development of the Marine and Coastal Environment**, in order to assist decision-makers in the implementation of programmes for the economic analysis of marine and coastal issues and the economical formulation of alternative policies for sustainable development, and at the global or multi-regional level, in order to develop recommendations on common methodologies to be applied through the **UNEP Regional Seas Programme** and to make available to decision-makers experience and knowledge accumulated through the Regional Action Plans.

In cooperation with the University of Rhode Island (URI, Department of Resource Economics, Prof. Thomas A. Grigalunas, Prof. James J. Opaluch and Jerry Diamantides, Instructor in Economics) and the University of Washington (Department of Economics, Prof. Gardner M. Brown Jr), UNEP OCA/PAC has prepared a series of reports focusing on methodologies to value goods and services provided by the marine and coastal environment, with a special emphasis on methodologies applicable to developing countries, for the purpose of experts training.

On the basis of these reports, the present document "Environmental Economics for Integrated Coastal Area Management: Valuation Methods and Policy Instruments" has been prepared to contribute in the implementation of programmes on the Integrated Management of Coastal Areas for national capacity building through training workshops and pilotstudies in some among the thirteen regions covered by the Regional Seas Programme. The present document aims at providing background information and case studies for economists well experienced in the field of microcconomics. The first series of activities on environmental economics based on the present document, will be developed in an integrated manner through the West and Central African Action Plan (WACAF) in 1995 in co-operation with FAO.

Professor Thomas A. Grigalunas served as principal investigator and coordinator for this project. He is responsible for Chapter 1, the Introduction, Chapter 5, Stated Preferences, and Chapter 9, Summary and Conclusions. He also co-authored Chapter 7, Other Approaches, and Chapter 9, Policy Instruments, with Jerry Diamantides; and was also a co-author Brown authored Chapters 3 and 4. These chapters cover the Travel Cost Method and Hedonic Analysis, respectively. Professor James Opaluch was the major author of Chapter 2, Economic Concepts, in collaboration with Professor Grigalunas. He also wrote Chapter 7, on the Productivity Approach. Jerry Diamantides, an Instructor in economics and a Ph.D Candidate at URI, co-authored Chapter 7, Other Approaches, and Chapter 8, Policy Instruments, both with Professor Grigalunas.

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CONTENTS

a a a construction de la construction de

Preface					
List of Figures and Tables					
1. IN	ITRODUCTION 1				
1. 1. 1. 1.	1 Background 1 2 Purpose, Scope, and Organization 5 3 Challenge Bay, Oceanus: A Hypothetical Case Study 8 4 References 16				
2. E0	CONOMIC CONCEPTS				
2. 2.: 2.: 2.:	1 Definition and Conceptual Framework for Economic Value 18 2 Producer Theory 25 3 Resource Use Over Time: Coastal Resources As Natural Assets 25 4 Market Failure 26				
2.: 2.: 2.:	5 Alternative Measures of Value 29 6 References 33				
3. T i	HE TRAVEL COST METHOD 34				
3.1 3.1 3.2 3.2 3.2	1Introduction342Concepts and Development of Method363Example Applications to Coastal Zone Management424Evaluation445References49Appendix A52Appendix B54				
4. HI 4. 4. 4. 4.	EDONIC VALUATION 56 1 Introduction 56 2 Concepts and Development of Method 57 3 Example of an Application to Coastal Zone 66 4 Evaluation 68 5 References 70 Appendix 72				
5. ST	TATED PREFERENCE METHODS				
5,. 5.2	1 Introduction				

. [.]

.

		· · ·
	5.3	Methodology
	5.4	Issues
	5.5	References
		Appendix
6.	PRO	DUCTIVITY APPROACH
	6,1	Introduction
	6.2	Conceptual Basis
	6.3	Case Studics
	6.4	Summary
	6.5	References
•7.	отн	ER APPROACHES
	7.1	Introduction
	7.2	Averting Behavior Models
	7.3	Benefit Transfer
	7.4	References
8.	POL	ICY INSTRUMENTS
	8.1	Introduction
	8.2	Purpose, Scope, and Organization
	8.3	Policy Instruments: Introduction
	8.4	Overview of Policy Instruments
	8.5	Policy Instrument Effectiveness
	8.6	Case Studies
	8.7	References
9.	SUM	IMARY AND CONCLUSIONS
	9.1	Introduction
	9.2	Challenge Bay Revisited

.

v

.

42

:

i

. .

.

÷

I

:

2

1

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i Sant

ſ

I

244

LIST OF FIGURES

Figure 1.1	Selected Linkages Among Activities, the Environment,
	and Losses to People: Challenge Bay
Figure 2.1	Depiction of Consumer's Surplus
Figure 2.2	Loss in Consumer's Surplus Due to a Price Increase
Figure 2.3	Effect of Quality Improvement on Consumer's Surplus
Figure 2.4	Substitutes and Consumer's Surplus
Figure 2.5	Depiction of Producer's Surplus
Figure 2.6	Deadweight Loss Due to External Cost
Figure 2.7	Comparison of Producer's Surplus and Economic
	Impact
Figure 3.1	Decision Tree for Resident Angler's Demand for
	Sport Fishing
Figure 3.2	Concentric Travel Zones
Figure 3.3	Construction of Travel Cost Demand
Figure 3.4	Beach Demand
Figure 3.5	Illustrated Travel Cost Example
Figure 3.6	City and Beach Geography 41
Figure 3.7	Valuing a New Site
Figure 3.8	Demand for Beach Trips with and without
	Pollution
Figure 3, E	B Probability of No Response as Function of Bid Amount
Figure 6.1	Linkages Between Environmental Damages and
	Losses to People
Figure 6.2	Linkages Between Pollution Incident and Damage Claim in
	Natural Resource Damage Assessment Model
Figure 9.1	Sclected Linkages Among Activities, the Environment,
	and Losses to People: Challenge Bay 161

LIST OF TABLES

预览已结束, 完整报告链接和二维码如下:

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