

# ECONOMIC VALUATION OF COASTAL RESOURCES – APPLYING RESEARCH AND RESULTS INTO ACTION

WORKSHOP AGENDA  
TUESDAY, AUGUST 21<sup>st</sup> 2007, 1:00 PM- 5:00 PM  
Fale Laumei, Lee Auditorium

## Introduction

Four US Island Territories, States, and Jurisdictions have completed coastal resource economic valuation studies, while two others are in the process of developing such studies. However, the results of these and other similar studies are not being used to their full potential. This workshop aims to:

- (a) Illustrate why it is important to understand/demonstrate the value of natural resources (particularly focusing on coral reefs) and why it is important to capture and enhance values by applying appropriate measures.
- (b) Outline the key findings/limitations of the economic valuation studies completed to date in American Samoa, Guam, CNMI and Hawaii
- (c) Highlight the range of measures, tools and approaches that can be used to apply values
- (d) Discuss the potential for application in American Samoa and other jurisdictions, particularly drawing on the experiences of participants
- (e) Explore potential follow-up actions/next steps to progress the implementation of measures.

## Workshop structure

Activity	Time	Description/approach	Who
Welcome	13:00	<b>Welcome to participants/ introductions</b>	Mike Hamnett, Chair
Opening Remarks	13:05	<b>Opening remarks from local host</b>	Lelei Peau
Introduction	13:10	<b>Theme: Introductory presentation covering:</b> <ul style="list-style-type: none"><li>• <b>Why it is important to apply values</b></li><li>• <b>overview of the economic valuation studies completed to date in the US jurisdictions</b></li></ul> Questions and answers (10 mins)  <i>Handouts will be provided</i>	Toby Roxburgh (Jacobs)

Applications	13:40	<p><b>Theme: Measures that can be implemented in order to capture/enhance values.</b></p> <p>Presentations of case study applications from US jurisdictions and elsewhere. The workshop organisers will provide an overview of potential measures and several case studies to start discussions.</p> <p>Case studies will focus on:</p> <ol style="list-style-type: none"> <li>1. Damage assessment for coral reef areas- Bob Richmond</li> <li>2. Marine protected area (MPA) user fees and sustainable financing- Toby Roxburgh</li> <li>3. Outcomes and lessons learned from Hawaii- Mike Hamnett</li> <li>4. Payment for ecosystem services- Toby Roxburgh</li> <li>5. Coral reef damage assessment law and policy- Steve Thur</li> </ol> <p>Issues to consider:</p> <ul style="list-style-type: none"> <li>• What was the process involved in taking the information and using it to influence public, private, govt, policy makers?</li> <li>• What worked and why?</li> </ul> <p>How was it tailored to meet the specific culture, local area (e.g. village), or specific needs and views of an area?</p> <p><i>Handouts will be provided</i></p>	Toby Roxburgh, Steve Thur, Bob Richmond, and Mike Hamnett
Break	15:00	Short refreshment break	
Strategies	15:10	<p><b>Theme: Key tools and approaches that can be used to implement measures.</b></p> <p>Facilitated discussion on tools and approaches that can be used to implement measures (thereby translating the information into practical uses). Key questions to explore might include:</p> <ul style="list-style-type: none"> <li>• Are the tools identified potentially useful for US jurisdictions?</li> <li>• How to use these to translate into policies and reach target audiences?</li> </ul>	Toby Roxburgh and Steve Thur
Next steps / actions	16:00	<p><b>Theme: Potential actions that can be taken in order to progress the implementation of measures.</b></p> <p>Open discussion amongst facilitators and participants. Key topics to discuss might include, for instance:</p> <ul style="list-style-type: none"> <li>• What next steps/actions can be taken to help apply values in the US jurisdictions?</li> <li>• How can information be shared to assist each other in developing strategies and products?</li> </ul>	Toby Roxburgh and Steve Thur
End	16:45	<b>Closing remarks</b>	Mike Hamnett

# Economic Valuation of Coral Reefs and Adjacent Habitats in Hawaii

## Fact Sheet

*Original report compiled by Cesar Environmental Economics Consulting as a result of research funded by the National Oceanic and Atmospheric Administration, Coastal Ocean Program, to the University of Hawaii for the Hawaii Coral Reef Initiative Research Program.*

The aim of the study (undertaken in 2002) was to quantify the importance of reef services in monetary terms to help communicate the importance of the reefs to policy makers, aid natural resource damage assessment, and assist in obtaining financial commitments to coral reef management. Objectives of the study were to: assess the economic value of three case study areas, and Hawaii as a whole, determine the economic costs of reef degradation, and compare the costs and benefits of various management options.

The study estimated the total Economic Value of the Main Hawaiian Islands coral reefs is **\$385 million per year**. A few of the most important benefits provided by the coral reefs include:

- \$304 million per year benefit due to recreation and tourism
- \$40 million per year benefit due to amenity/property
- \$17 million per year benefit due to biodiversity

A new education centre was built in Haunauma Bay, which was shown to have a net benefit over time of \$100 million. It was also shown that most visitors would be willing to pay an additional \$8 if a significant share of the fee was used for conservation.

Major algal blooms occur in the North Kihei area, and the case study has shown that if the algal blooms continue, annual benefits from coral reefs will reduce from \$25 million to \$9 million. If nutrients are successfully reduced and algal blooms subsequently diminish, annual benefits will increase by \$30 million, predominantly as a result of growth in property prices.

Of the aquarium fish collection, 58% of the State total occurs along the Kona coast. In 2002, the estimated gross value and profits were \$1.8 million and \$0.7 million respectively. In 2000, 35% of the Kona Coast was designated as a Fish Replenishment Area (FRA) prohibiting the collection of aquarium fish, as a result of public concern of overfishing. Preliminary findings suggest unprotected areas are now more heavily fished, however FRAs should benefit the aquarium fishery through enhanced recruitment and possibly spill-over which should counterbalance higher collection intensities. Increased biodiversities in the FRAs will benefit the recreation industry, which composes 45% of the reef-associated benefits along the Kona Coast.

# Economic Valuation of Coral Reefs and Adjacent Habitats in American Samoa

## Fact Sheet

*Original report compiled for the Department of Commerce by Jacobs in association with MRAG Americas, National Institution of Water & Atmospheric Research, Prof. N. Polunin.*

The American Samoan Coral Reef Advisory Group decided that the economic valuation of the island's coral reef resources would be an aid to the management of the reef. In order to do this, information was reviewed, village discussions occurred and the general public was surveyed with a contingent valuation questionnaire. This questionnaire was designed to determine the use and importance of coral reefs and mangroves as well as the dollar amount people were willing to pay for continued access to and benefits from these resources.

As of 2004, the coral reefs of American Samoa provide benefits on the order of **\$5.1 million/year**, and the Territory's mangroves add an additional **\$0.75 million/year**. These critical natural resources combine to account for **1.2% of the American Samoa GDP**. A few of the most important benefits provided by coral reefs include:

- **\$722,000/year** benefit due to coral reef fisheries
- **\$73,000/year** benefit resulting from recreational uses
- **\$70,000/year** benefit deriving from bottom fishing
- **\$447,000/year** benefits relating to shoreline protection provided by the reefs

These are just some of the benefits, economic and otherwise, we stand to lose unless extensive efforts are made to increase our understanding of and protect these fragile ecosystems from the threats posed by global climate change, overpopulation, land-based sources of pollution, and over fishing.

An **additional gain of \$2,753,000/year** in direct benefits could be realized through the complete and effective implementation of proposed mitigation and enhancement measures, as well as management initiatives such as fisheries regulations and controlling coastal development.

# Economic Valuation of Coral Reefs and Adjacent Habitats in Commonwealth of the Northern Mariana Islands (CNMI)

## Fact Sheet

Original report compiled by Cesar Environmental Economics Consulting under funding from the US Department of the Interior and National Oceanographic and Atmospheric Administration.

The main objective of the economic valuation of the CNMI coral reef resources is to aid decision makers in deciding the level of protection and conservation required for the reefs. The valuation also helps communicate the importance of coral reefs, provide baseline information on the benefits of the reefs, and can be used as leverage to gain additional support for reef protection priorities.

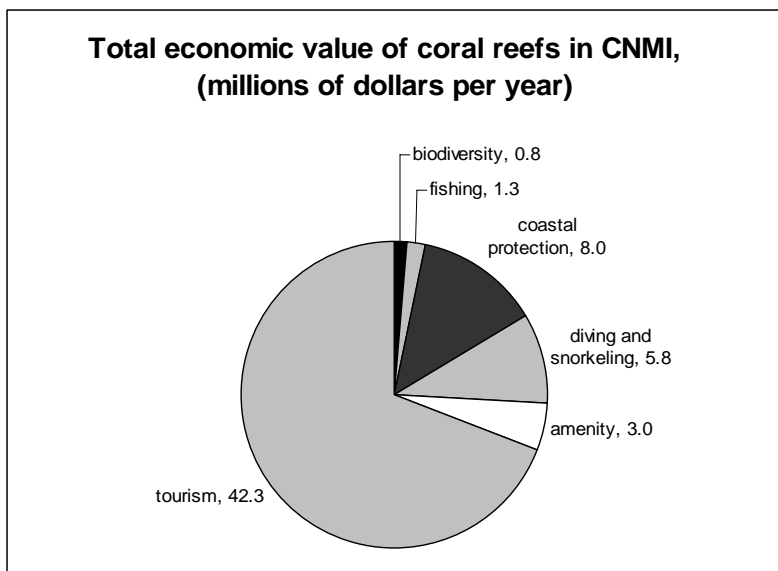
A household survey of 375 local residents was undertaken to determine the nature and level of use and non-use values of coral reefs. This showed that residents were concerned about further deterioration of the marine environment and would support policy interventions by the Government to reverse the trend of deterioration. A Discrete Choice Experiment (DCE) was used to estimate non-market values of the reef and indicated that generally residents would be willing to pay more taxes to address issues of pollution of the coral reefs.

GIS was used to determine the variation in TEV between different reefs and assess the variability of anthropogenic threats to reefs. The aim of this was to provide a basis for prioritising reef protection measures, and the results indicate that the more valuable reefs are generally in poorer condition and face more anthropogenic threats.

The Total Economic Value of reefs of CNMI is **\$61.16 million per year**.

The market values comprise the TEV, and the non-market values comprise the remaining 27%. The largest single benefit provided by coral reefs is \$42.31 million due to tourism. Coastal protection provides benefits of \$8.04 million.

The report concluded with main recommendations, combining the findings of the valuation study and associated surveys with priorities identified in CNMI's Local Action Strategy. These recommendations include establishing measures to: (1) Address the issue of non-point and point source pollution; (2) Make use of the cultural importance residents place on marine ecosystems to improve coral reef management; and (3) Develop a comprehensive system of user fees for visitors of MPAs on Saipan.



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A copy of the report is available on-line at:  
<http://cnmicoralreef.net/Saipan%20final%20report%20zip%20Feb2006.pdf>.

## Economic Valuation of Coral Reefs and Adjacent Habitats in Guam

### Fact Sheet

*Original report compiled as a result of research funded by the National Oceanic and Atmospheric Administration through the Marine Laboratory of the University of Guam.*

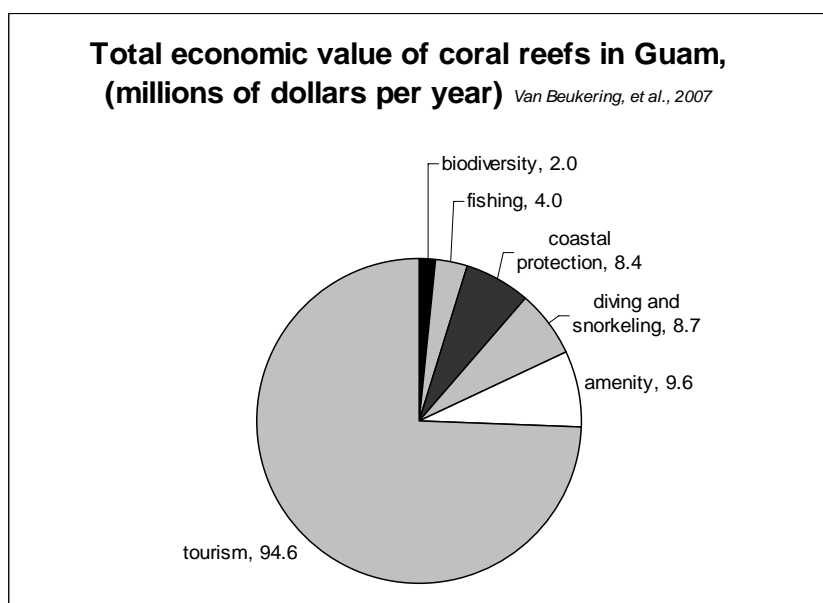
The objective of this economic evaluation was to provide a basis for policy makers to decide the level of protection that should be provided to the reefs, and to provide a basis for damage and rehabilitation assessments.

A household survey of 400 residents was undertaken to determine the nature and level of the cultural value of coral reefs. This study showed that over 90 percent of Guam residents make regular use of the beach and ocean for activities such as swimming, barbequing, fishing, and snorkeling. Approximately 40 percent of local residents fish on a regular basis, which was identified to be more important as a social activity rather than an income-generating activity. This survey also indicated that residents would support policy interventions that aim to reverse the trend of deterioration of the reef habitat.

A Discrete Choice Experiment (DCE) was used to investigate three important non-market benefits.

GIS was used to determine the variation in total economic value between different reefs and assess the variability of anthropogenic threats to reefs. The aim of this was to provide a basis for prioritising reef protection measures, and the results indicate that the more valuable reefs are generally in poorer condition and face more anthropogenic threats.

In economic terms, the value of Guam's coral reefs is derived from tourism, diving and snorkeling, fishing, property values, coastal protection, and biodiversity. **Total economic value for Guam's reefs was estimated at \$127.28 million per year**, with tourism accounting for approximately 75 percent of this value, as shown below.



# Natural Resource Damage Assessment in the United States: Law, Practice, and the Use of Economic Valuation

Steven Thur, NOAA

## Natural Resource Damage Assessment (NRDA)

The U.S. has enacted several statutes that designate various entities as natural resource trustees. These laws enable trustees to recover damages for injuries to resources under certain circumstances. Funds recovered via NRDA are used to pay for restoration of the injured resources. There are two types of federal statutes that pertain to NRDA: U.S.-wide legislation that covers only specific causes of injury and location-specific legislation that covers virtually any cause of injury. The most commonly employed are:

- Oil Pollution Act (OPA): nation-wide; when resources have been injured as a result of an oil spill or activities taken to alleviate an imminent threat of an oil spill.
- Comprehensive Environmental Response, Compensation, and Liability Act: nation-wide; when resources are injured because of the release of a listed contaminant.
- National Marine Sanctuaries Act (NMSA): within Sanctuaries only; when any natural or cultural Sanctuary resource is injured by virtually any action.
- National Park System Resources Protection Act: within National Parks only; when any National Park resource is injured by virtually any action.

Most coral reef-related NRDA in the U.S. are pursued under the OPA or NMSA. In addition to these federal statutes, several states and territories have their own legislation.

## The Use of Economic Valuation in NRDA

The purpose of NRDA is to restore natural resources so that the public is made whole following an injury. NRDA is *compensatory*, not *penal*, in nature- it is designed to compensate for losses experienced by the public, not to punish those responsible for the injury. NRDA practice in the United States is to use the cost of restoration as the measure of damages, and this has been upheld in several court cases. Trustees assess the damage, determine the amount of physical restoration that is necessary to make the public whole, and seek the cost of restoration from the responsible party. Economic valuation is not used in standard NRDA. It is the cost of the restoration that matters to the trustees, not the value of the resources injured.

It may be appropriate to use economic valuation to establish a civil penalty system that is used in conjunction with the NRDA process. For example, the NMSA provides for both NRDA and the issuance of regulations governing the use of Sanctuary resources. The Florida Keys National Marine Sanctuary has a schedule of escalating fines for injury to living coral based on the area of impact. In certain cases, Trustees have pursued both NRDA damages and civil penalties for the same incident. While economic valuation studies may provide the basis for such a penalty system, they typically estimate *total* economic value for a location. Division of the *total* value by the area of the coral reef produces an *average* per-unit value. If injuries affect a relatively small portion of the total reef area, then it is most appropriate to use the *marginal* per-unit value in setting the fine. Because there is no relationship between *average* and *marginal* values, it may be necessary to alter *average* per-unit values derived from economic valuation studies when creating a penalty system. Regardless of any such alteration, the economic valuation study will be useful if the employed penalty system is legally challenged.