

The Valuation Of Marine Ecosystem Goods And Services In The Caribbean: A Literature Review and Framework for Future Valuation Efforts

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Purpose

- Provide an overview of economic analyses of marine ecosystem services for the three major marine ecosystem types in the Wider Caribbean Region (WCR) - reef, pelagic and continental shelf (CLME Project, 2011).
- Identify gaps, deficiencies and unknowns.
- Create a framework for future valuation efforts in the WCR.

Literature review methodology

- Computerized searches of keywords (e.g. 'ecosystem services', 'fish', 'fisheries', 'marine protected area'...), combined with terms denoting economic measures (e.g. 'benefit', 'consumer surplus', 'value', 'valuation', 'willingness to pay'...), combined with names of the 37 countries and territories in the Caribbean region.

Literature review methodology

- ...online valuation databases (e.g. the Marine Ecosystem Partnership, the National Ocean Economics Program and The Environmental Valuation Reference Inventory).
- Publications accessible through 2013.

Literature review methodology

- Approximately 225 studies from the grey literature and peer-reviewed literature were reviewed, of which approximately 110 contained formal value estimates.
- This is an overestimate of the number of unique *studies* containing economic values of marine ecosystem goods and services in the Caribbean, but an underestimate of the number of unique value *estimates* for ecosystem goods and services in the Caribbean.

Literature review methodology

- Studies reviewed for this report include analyses of primary and secondary data, benefits transfer applications, meta-analyses and case studies.
- Approximately 70 percent of the research reviewed appears in the grey literature.
- Nearly half contain at least some application of non-market valuation methods.

Marine resource valuations in the WCR

- General focus is on more obvious and measurable benefits, i.e. those derived from coastal and reef ecosystems associated with protected areas, recreation and tourism.
- Analyses of benefits from pelagic and continental shelf ecosystems are rare.
 - o disconnect between offshore systems and tourism
 - o relative dearth of scientific knowledge of these systems

Ecosystem service types

Most attention:

- Cultural Services
 - Physical and intellectual interactions (recreation)
- Provisioning Services
 - Food (capture fisheries)
- Regulating and Maintenance Services
 - Mediation of flows (shoreline protection services)

Ecosystem service types

Least attention:

- Cultural Services
 - Spiritual, symbolic and other interactions
- Provisioning Services
 - Medicine
- Regulating and Maintenance Services
 - Mediation of wastes/toxics

Ecosystems

Most attention:

- Reef systems
 - Especially with regard to recreation within marine protected areas.

Least attention:

- Shelf system
 - Exception: market valuations of commercial fisheries.

Locations

Most attention:

- Jamaica, Bonaire, Curacao
- Barbados, the Bahamas, St. Lucia, Trinidad and Tobago

Least attention:

- Antigua-Barbuda, Aruba, Cuba, Haiti, Montserrat, Nicaragua, Panama, St. Maarten

Economic sectors

Most attention:

- Recreation and tourism
- Capture fisheries

Least attention:

- Marine Transport
- Marine-based Renewable Energy
- Deep-sea Minerals

Common findings

- The economic value of coral reefs for recreation and tourism and coastal protection commonly found to be much larger than the values associated with fisheries.
- User fees as a basis for financing conservation are underutilized in the region.

Common findings

- Many reef-dependent fisheries comprise only minor components of national income.
- Most fishers can be characterized as marginally profitable at best.
- Small-scale fishers in the WCR are highly dependent on reefs for livelihoods and food security.

Gaps in valuation knowledge

- Regulating and maintenance services
 - E.g. contribution of coastal ecosystems to fisheries production, climate regulation and habitat provision.
- The economic impacts of overfishing.
- The relative economic impact of fisheries subsidies in terms of short-term benefits to employment and livelihoods vs. future costs related to overfishing

Other areas of Interest for Future Research

- Valuation of the cultural and security benefits of small-scale fisheries.
- Valuation of the amenity value of beaches and reefs to coastal property owners and well-being in local communities.
- Valuation of the contribution of reef ecosystems to fisheries production, climate regulation and habitat provision.

The way forward?

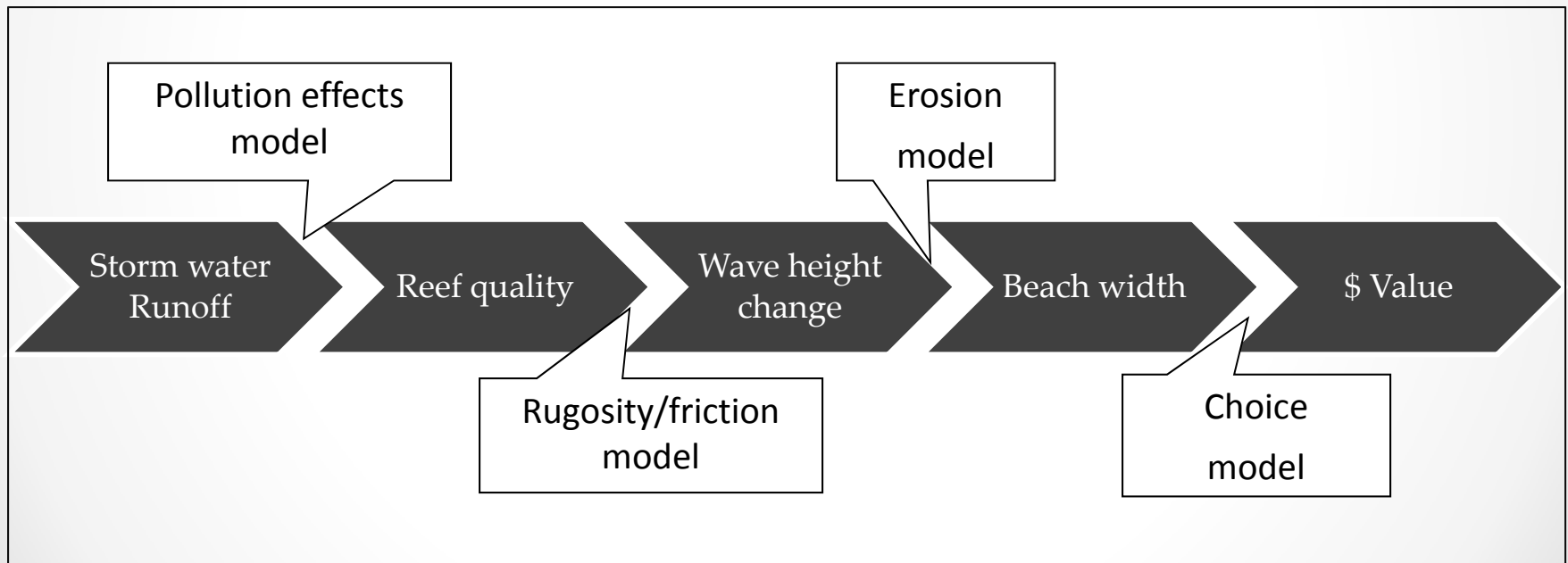
- An integrated, multidisciplinary approach to valuation based on ecological production functions
 - o Identify ecological processes that affect human well-being
 - o Construct ecological or bio-physical production models that transform natural or anthropogenic changes in ecosystem services into measurable indicators of benefits

Ecological production models

- How do policy actions (or inaction) affect ecosystem structure and function?
- How do these effects on the ecosystem translate into changes in ecosystem services?
- How do these changes in ecosystem services affect measurable benefits to people?

Example

- Kushner, B., Edwards, P., Burke, L., Cooper, E., 2011. Coastal Capital: Jamaica. Coral Reefs, Beach Erosion and Impacts to Tourism in Jamaica. Working Paper. World Resources Institute. Washington, D.C.



Considerations

- Avoid double counting by distinguishing between ecosystem services and ecosystem benefits
- Derive value estimates in the context of marginal changes to resource quality or ecosystem services
- Use caution when aggregating
- Engage stakeholders throughout

The way forward?

- For this approach to be effective and incorporated into sustainable development planning, it must be mainstreamed into regional policy processes and adopted and promoted by regional organizations.
 - o Caribbean Large Marine Ecosystem Strategic Action Program (CLME SAP)
 - o The Caribbean Regional Fisheries Mechanism (CRFM)
 - o The Central American Fisheries and Aquaculture Organization (OSPESCA)
 - o The UNEP Caribbean Environment Program (UNEP CEP)
 - o The Caribbean Tourism Organization (CTO)

The way forward?

- The mainstreaming process will (hopefully) generate dialogue regarding which ecosystem service should be given priority for valuation attention.