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Economic Valuation of Large Marine Ecosystems

Report from the IUCN workshop, July 29-30, 2007

Interactive Online Version

IUCN Global Marine Programme

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Report compiled by James Oliver (IUCN)

Workshop on Economic Valuation of Large Marine Ecosystems

July 29-30, 2007 at the Hotel Commodore, Cape Town

Background information

Number of Participants: 21 representing South Africa, Madagascar, Namibia, Kenya, Tanzania, Mozambique, the Benguela current LME, the Caspian Sea region, the Yellow Sea region, the Mediterranean, Europe & Central Asia regional seas, and the Pacific Islands.

Worksite:
http://earthmind.net/marine

Online Resources:
Participants list
Photo gallery
Focussed Learning Discussion at IWC4
Workshop personal action plan form
Further reading on Economic Valuation
Useful websites

Contents

Introductory Session

- ECONOMIC VALUATION FOR LARGE MARINE ECOSYSTEMS - WORKSHOP OVERVIEW
- PRINCIPLES OF ECONOMIC VALUATION OF ECOSYSTEMS (FRANCIS VORHIES)

Mick O'Toole, coordinator of the Benguela Current Large Marine Ecosystem (BCLME)

- Of the 5-sector approach to LME management, the socio-economic element has remained somewhat underdeveloped, but is now being fully addressed.
- The cycle from GEF submission to birth of the Interim Commission overseeing the LME took 10 years and will take a further 4 years to become legally-binding (lesson learnt: these processes take a long time)
- Industry and government will need to sustain the Commission as GEF funding dries up. The biggest industries in the Benguela LME are, in order of importance: oil & gas, diamond mining, tourism, and then fisheries, although in Namibia these account for up to 10% of revenues.
- Need to identify and the capture economic values of the BCLME in order to conserve it

Goals of the workshop

- How to use Economic Valuation (EV) as a tool
- Not how to conduct one: this is best left to experts!
- Learn to look at what the values are but also who benefits
- Identify sources of revenue generation that can be secured and to achieve national-level buy-in
- Work towards a conceptual framework to link LME activities to Millennium Development Goals (MDGs) and other international processes

Related comments after Introduction

- Valuations are a snapshot in time with a limited shelf life.
- Values, benefits and services are basically interchangeable terms for the same thing.
- The tourism industry is fickle and making its value often difficult to predict and measure.
- Very different valuation results can be obtained with different approaches…how to reconcile?
- That depends on your priorities. In terms of job creation, one person's benefit may well be another person's cost.
- In terms of income generation, sometimes values can be calculated quite accurately in the same way as the selling price of a house may be calculated by looking at the potential value of rent.
- Value is not only represented in monetary terms but also as indicators to support the decision-making process.

Caspian Environment Programme: Experiences and lessons learnt

Hamidreza Ghaffarzadeh, Caspian Environment Programme

- There are different views on EV: some might say outright that the environment is "not for sale" and therefore disagree with using the concept. Others may say that it is practically impossible to assign values or that values are so far off the mark that they are almost useless.
- Supporters of using EV would counter that such an attitude leads to the environment being excluded from the decision-making process altogether.
- EV is useful for establishing a "red line" that should not be crossed e.g. in the case of fisheries.
- Money talks so EV helps find the optimum level of use, extraction, distribution, income-generation etc.

Challenges to Caspian EV

- Absence of markets
- Distortions (subsides etc)
- Assumptions open to question
- Poor data
- Bias
- Not taken seriously at many levels (macro-economists, NGO activists, some ministries…)

Needs

- EV needs to be built in as a component of GEF projects

Caspian EV Workshop findings
(Participants were from both environmental and financial backgrounds)

- Resistance to apply methods
- Not a total understanding of the concepts
- Case Study material could have been better
- Lack of a follow-up
- The value of the lost fisheries in Iran (sturgeon catches down from 2000 tons pa to under 200 tons): a gain can be demonstrated by showing that the cost of doing nothing and losing the resources far exceeds the cost of taking preventative measures
- Need to overcome the resistance from those who have a vested interest in the status quo
- Using a simple methodology based on guess estimates (defenceless in the face of scrutiny and not using non-use values), the losses from Caspian sea-level rise were demonstrated. This shocked decision-makers into developing an action plan according to various scenarios.
- A numbers exercise was also carried out to evaluate the cost of invasive species on the kilka fishery. Elements analysed included maximum sustainable yields, loss of employment and payment of unemployment benefits, lost investment in industrial processing plants and of course the decrease in the sales of fish. The figures associated with doing nothing against the invasion were presented, but despite being a useful exercise, it did not establish the cause and effect and did not lead to an action plan.

Lessons learnt

- Theoretical justifications are an important element, including the combination of factors
- There is a need to build further capacity
- Be simple because too much complexity is likely to backfire
- Add non-monetary factors such as jobs, scenic value into the equation
- With the strategic use of economic information EV can be used to stimulate discussion

Benefits and Costs: What are the issues?

Francis Vorhies, IUCN Economics Adviser

FISHERIES

- Impacts can be very visible
- Wide livelihood dependency
- Types of activity and uses include commercial, artisinal, aquaculture, ornamental, sports and non-consumptive (e.g. whale watching)
- A reality check is needed in the industry and setting of priorities
- Of all scenarios, most are in decline – aquaculture the only growth area

MINERAL RESOURCES

- Out of sight (often)
- Capital intensive
- Cash-flow of limited universal benefit
- Oil and gas projects typically over 10 to 15 years (5x typical environmental project)
- Diamonds through seabed mining: can in some cases help set up an infrastructure for aquaculture thereby presenting economic opportunity offsets)
- In developing countries, both fisheries and extractive industries are subject to a "full steam ahead" approach. There are no trade off arguments.
- In developing countries, there are often different ministries for fisheries and extractive industries for obtaining permits and a lack of coordination between sectors
- Oil and gas is often an overriding priority for governments as money comes in quickly and the benefits are very visible. They therefore tend to dominate fishery interests.

TOURISM

- Hard to separate out marine-based tourism values
- Important to assess actual role in LMEs

PRESSURE GROUPS

- Fishery pressure groups are very strong
- Sweden: only 2000 are employed in fishing and have managed resource poorly – for salmon, a switch to recreational fishing makes more sense (much higher value per fish)

ENERGY

- Windmills and wave technology: need for more marine spatial planning. For offshore windmills a hard substrate is often favoured so is in competition with fish feeding and breeding habitats.

SHIPPING

- Shipping industry is 50x bigger than fishing industry in the Mediterranean. Consider the value of shipping lanes and the secondary industries to shipping

SOCIO-CULTURAL VALUES

- Strong cultural attachment of fishermen to their lifestyle

MARINE BIOPROSPECTING

AESTHETIC VALUE OF OCEAN VIEWS

- Adds $1m to house values in Chesapeake Bay

Related comments

- Price does not equal value. Value is what society is willing to pay (the area under the demand curve)
- 30-40 years down the line, interest rates render values insignificant and unrealistic
- In South Africa, there have been Business Plans over 80 years (for mining), but this is exceptional
- For biological resources, such as whales, you need to look at the growth rate to know what a sustainable harvest can be. Whales may grow as little as 2% p.a. in which case any extraction over 2% equates to "mining" the species resource. Orange roughy and Patagonian Toothfish are other similar low-growth examples.
- In the BCLME, the underlying productivity can mean that good management could bring back valuable fisheries. It is therefore important to establish baselines: what is it worth now? What was it worth in the 50s and 60s? What if it disappears? What investment is needed to get it back to the level of the 1950s?
- Spending money on reduced harvesting can really pay off. The big challenges are management of migratory species, international cooperation is difficult to achieve.

Who are the customers of EV of LMEs?

In view of the huge and complex task, it is beneficial to concentrate on the basket of factors to evaluate and to look at the regional issues. There is a need for a high-level commission to analyse the factors. Land rights also need to be integrated.

Can decision-makers act on the results of EV? Generally not if it goes against their priorities or what they want to hear.

EV did however raise the profile of coral reef management in Indonesia when a value of coral reefs was calculated.

Yellow Sea experience – the economics of environmental management actions

Isao Endo, UNDP/GEF Yellow Sea Project

ENVIRONMENTAL VALUATION AND COST-BENEFIT ANALYSIS OF MANAGEMENT ACTIONS

Basics of environmental valuation

The presentation explained the basics of economic analysis of environmental management actions:

- Economic Value can be defined as the sum of Consumer Surplus and Producer Surplus.
- To measure value, estimate demand & supply for concerned goods.
- Consider negative externality, if any.
- Various valuation techniques are available, including empirical technique, Travel Cost Method (TCM), and Contingent Valuation Method (CVM).
- Multiple-step procedure for Cost-Benefit Analysis CBA) of management actions, including:
    - Monetise the benefits and costs.
    - Calculate the net present value of the benefits and costs.
    - Conduct a sensitivity analysis.
- Compare with-or-without action scenarios.
- Management actions make sense if their benefits > costs.
- The cost-benefit analysis helps in making an environmental decision-making efficient, and therefore in justifying the decision in public.

Cost-benefit analysis of management actions in the Yellow Sea Project

Yellow Sea Project conducts the cost-benefit analysis of management actions in the preparation of the Project's Strategic Action Programme.

- A possible target of the analysis is mariculture. The maricultrue production in the Yellow Sea region accounts for more than 70% of the world's mariculture production.
- Regional experts have proposed to introduce sustainable mariculture practices such as "polyculture." The polyculture is a type of aquaculture to grow different complementary species (i.e., finfish, shellfish, and marine plants) together. It is expected that polyculture not only increases revenues in aquaculture production, but also reduces environmental impacts by removing excess nutrients.
- The cost-benefit analysis will examine the economy of this management action by addressing the following research question: Does introducing polyculture make sense economically?

Related comments

- When you bring poverty into the equation, it is very important to conduct representative sampling in the methodology and samples must be random to minimise bias
- A weakness of Contingency Valuation (willingness to pay approach) is that use by poor communities is devalued as compared to affluent users
- All income levels must be represented or at least all players in the market (some are excluded if services are not affordable to them)
- Assumptions set the boundaries of the valuation. A huge number are necessary but they must be listed.
- Willingness to pay: more accurate when sorted and weighted by income group (ability to pay).

- Assumption analysis may be enough on its own (without figures to support) to dissuade investment in a project – particularly when the discount rate (interest vs. future benefits) and alternative uses are factored in
- Further resources: www.ecosystemvaluation.org
- The methodology choice is key and may be influenced by
    - The availability of market values
    - What type of story is easy to communicate
    - Regional priorities
    - Applicability of Contingency Value (E.g. not applicable to mariculture)

The economics of LMEs: The case of the Benguela Current Large Marine Ecosystem (BCLME)

Tony Leiman, University of Cape Town

ECONOMICS IN LARGE MARINE ECOSYSTEMS: THE CASE OF THE BCLME
LECTURE NOTES

- Large Marine Ecosystems are dynamic interdependent communities: the effects at one end of the ecosystem will have an affect at the other end.
- As soon as an ecosystem boundary crosses borders, the management becomes that much more difficult. The countries of the BCLME have different socio-economic characteristics:
  - Angola: very high oil revenue: fisheries, both industrial and artisinal, are lower priority
  - Namibia: fisheries (mostly industrial in nature) are important to the economy and are under threat
  - South Africa: fisheries are important but account for a small % of GDP. South Africa has a more broad-based economy.

- Modelling looking to maximise global income from fisheries should start first with a biological model with species interaction, and then look at extraction scenarios of predator and prey species.
- The problem of property rights is complicated by migration, straddling stocks and the lack of regulation in the high seas
- The legal systems differ across BCLME countries (penalties, permits, etc.)
- Maximising rent requires a "jump of logic". It is not unusual to find three different companies concentrating on three different species.
- The ecosystem approach requires very difficult modelling and a need for data sharing (this works fairly well in the BCLME)

Related comments

- Maximising benefits requires international cooperation as examples of salmon in the Baltic and herring in the North Sea demonstrate.
- Political shortsightedness and ignorance of the issues can be a big obstacle to international cooperation when stocks accumulate on one or other side of the border.
- Crews have an important role in managing by-catch and "highgrading" (tossing overboard low value catch)
- Highgrading costs the fishing industry a lot of money
- Foreign crews tend to have less to lose (from loss of permits) so will be more inclined to cheat.
- It is easier to monitor a small number of fishing companies and they have a greater incentive to look after stocks sustainably.
- An ideal management structure will avoid the use of perverse incentives
- Eco-labelling is becoming more significant. It needs everybody's buy-in but is hindered by transboundary issues
- Trade policies governing where fish are sold (and the restriction of dumping in other markets) is another important factor. It impacts the financial sustainability of the industry.
- The price of fish is subject to many microeconomic factors
- The size and composition of the fishing industry is governed by political decisions
- The highest potential for added value is in the lowest grade fish
- What would be the cost of stopping the global fishing effort compared to the potential benefits of stock revival? The experience of World War Two demonstrated the ability of depleted areas of the ocean to restock in a relatively short period without extraction.
- The elimination of subsidies could free up large sums of money for international-level management and enforcement – especially in Europe.

Using valuations to influence decision-making: The economic value of marine protected areas along the Garden Route coast

Deon Nel, Manager WWF Aquatic Unit, South Africa

THE ECONOMIC VALUE OF MARINE PROTECTED AREAS ALONG THE GARDEN ROUTE COAST
WWF REPORT

The issue tackled by WWF was the question of whether to allow sports fishing in South Africa's oldest MPA. The situation was highly political and because the area concerned was of national importance, it was necessary to consult at national level. Until WWF intervention, there had been very narrow stakeholder consultation. Based on interviews, figures for visitor behaviour and willingness to pay were thrown into the mix: a decrease of 16% in the number of visitors, a 4 million one-off gain for allowing sports fishing versus a 4.1 million annual income if the restriction was maintained.

The main lesson learnt was that Economic Valuation is about asking the right questions and about putting the story on the table. Of utmost importance are: the packaging, the communications, and researching the target audience. "Numbers are just the excuse."

Related comments

- The WWF figures did not include the "safety net" value of such a rich marine biome as a refuge and nursery for degraded outlying areas (this could be framed as a "reduction of risk" argument as used in the private sector.
- A wider context could have been looked at with multi-use zones and diving areas as a non-consumptive use.

Examples of EV successes and failures

Francis Vorhies, IUCN Economics Adviser

VALUATION CASE STORIES FROM SOUTH AFRICA

Failures

- KwaZulu park project – consultation not wide enough, local stakeholders ignored so project failed
- Water conflict in Sabi Sand River: Orange grove versus tourism needs downriver. Too much transparency in approaching the orange company for figures and reports led to denial of access to figures. No proper study could be carried out so the EV failed. Even the preliminary phase needs to be strategic!

Successes

- A dam project threatening endemic and red-listed (but low value) fish species was thrown out only on the basis of the questions raised. The threat of a valuation study was enough to kill the project.
- Lion reintroduction into the Pilanesburg National Park: based on an estimated 10% increase in lodge and hotel occupancy, it was estimated that with an investment of $300,000 p.a. there would be total benefits totalling about US$ 10 million (over *x* period). Three discount rates were applied to give three different scenarios – thereby adding credibility. The project was approved.
- Mining proposal in the St. Lucia dunes: This threw up a conflict over mining interests vs. conservation interests vs. Zulu land rights. The mining co withheld information but with hard-hitting questions about discount rates, jobs, foreign earnings, cost-benefit analysis and environmental impact, the project was deemed not to be the best economic option.

Understanding how valuation can and cannot contribute to LME goals and objectives

For the rehabilitation of LMEs, what investments are needed? What will be the benefits?

Related comments

- Lessons learnt in Indonesia: EV led to a management plan and new structures for coral reef management. The figures quoted were an eye-opener for local decision-makers who had not previously tried to gauge the value of reef systems.
- Speaking a language a Finance Ministry can understand can make a huge difference
- Raising awareness and communication with decision-makers is so important and language needs to be adapted accordingly
- Is it an opportune time to do a full EV in the BCLME to support the newly-created Commission
- The Yellow Sea experience was that different techniques were used to get the numbers, cost-benefit analyses were made and the study was used to move forward the management plan. The cause and effect issues are still hazy and scientists are cautious of the need to use brave assumptions.
- In the long-term and to maintain credibility, it is better not to make over-optimistic estimations (e.g. prediction of a tourist boom) in an EV. This could lead to a closure of an approved project and a return to the prior situation. Therefore exercise caution in presenting rosy scenarios.
- Perverse situations can occur due to demand elasticity as demonstrated by the example from Phuket: high prices for fish on the local market has led to a situation where fishers are happy with a low yield and low productivity in the marine environment.

Designing and implementing valuation studies in the GCLME region

Chika Ukwe, Industrial Development Officer (International Waters), UNIDO (Vienna)

DESIGNING AND IMPLEMENTING VALUATION STUDIES IN THE GCLME REGION

Experiences

- Challenges emanate from the fact that some data is held privately and there is a reluctance to share
- Two scenarios were applied to calculate Resource Rents: with and without GEF funding with differences attributable to licencing issues, control of illegal fishing, and better management of transboundary resources. Assumptions included full implementation of the Strategic Action Plan (SAP), successful project design, and full achievement of all other objectives
- One valuation looked at the consumptive use of an invasive species: the Nipa palm and presented an increased added value approach
- There was some success in getting the oil and gas industry to support mangrove restoration
- High environmental stress leads to a situation where predictability diminishes and variation increases
- Ten year scenarios often used as this reflects available funding from the GEF cycle

Goals

- Increased awareness of the local population with respect to the value of local ecosystems and resources
- Increased tax revenues to allow national governments to pay back loans (the rationale being that better management would lead to higher revenues)
- Good monitoring: The financial sustainability of projects is reliant on future funding from national governments, development banks (mainly African Development Bank)
- Aligning objectives with internal government priorities (those of ministries handling both fisheries and the environment) is key to obtaining investment

Prerequisites

- A system of national accounting and co-financing from national institutions
- Risk assessment: Natural, climatic, political, disease-related (in the case of aquaculture) – looking at how the insurance industry quantifies this could be useful

Related comments

- The methodology needs to be displayed in a scenario report to maximise credibility
- Don't underestimate the amount of "homework" needed to get data to back up the presentation of a "wow" number (a surprisingly high valuation)

Designing and implementing valuation studies: A roadmap

Francis Vorhies, IUCN Economics Adviser

DESIGNING AND IMPLEMENTING VALUATION STUDIES: A ROADMAP

- An early focus is critical
- A total economic valuation is not always necessary, just a cluster of values
- Gauge who will react to the message (even if unintended)
- A team of people with diverse skills is needed to conduct stakeholder engagement

Related comments

- The media (especially now) will publish almost anything. This "power" should be used cautiously and responsibly by environmental practitioners
- In the Yellow Sea area, policy-makers are not scientists: interest can be generated with just provisional figures thereby sparking demand for a more comprehensive set of figures
- Involve policy-makers at an early stage
- In Gabon, the presentation of a film (the GCLME film together with the Al Gore film) sparked increased awareness, interest and a thirst for action
- Within the framework of a project, resources for EV are necessary to monitor and follow-up factors such as the evolution of employment, market prices (esp. for fisheries-related work etc. throughout the length of a project life cycle
- All stakeholders should be convinced that they do have a say and hold status
- A cost-efficient methodology should be a priority
- EV was a useful tool in the context of uranium mining within protected areas
- Use of EV in the Pacific is currently not well documented. There is little awareness at the level where political decisions are made.
- Artisinal and recreational fisheries are difficult to value
- An EV with credible figures boosts the commitment of resources
- EV can be a valuable tool in helping allocate restricted resources efficiently

Perceived future application of the workshop experience by participants

- For influencing decisions at national policy level and engaging with the private sector and so remain part of the debate (Deon)
- For the introduction of a work programme on EV and to raise awareness at convention level (Johnson)
- For targeting the national level where priorities are set esp. ministries responsible for fisheries development and MPAs, and to help frame issues so that they become priorities. (Jacob)
- For the assessment of projects potentially affecting the marine environment (at inter-ministerial level) and use EV to lobby for strategic resources and influence mining decisions (Haja)
- To engage World Bank managers and high-level ministerial representatives in a dialogue on Caspian bio-resources and fisheries issues (Amy)
- To scale down fisheries and to push for the setting up of fisheries and environmental commissions (Hamid)
- To target sectors where the resources are concentrated and for advocacy in resource allocation (Teo)
- To lobby the Ministry of Planning and Development for a more sectoral approach, to bring on board provincial government representatives and to scour the wider region to find EV expertise (Eben)
- To help Pacific Island states to build their own fishing capacity instead of relying on selling rights (Barbara)
- To take regional extrapolation to local level (Chika)

Related comments

- Good examples exist within the LME community, some of them influential in the decision-making process and for leveraging more resources

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