

# Green, red or black?

**DJUNA IVEREIGH** says that the true value of protected areas is now beginning to be assessed, and describes innovative ways to increase their revenue

**W**hat is the value of clean air and clean water? Of pristine forests and marine reserves? These questions now challenge ecologists and economists, bringing them together in the growing field of economic valuation. Valuation can help park managers, communities, businesses and governments find a common language and realize that they make better friends than foes. And acknowledgement of the costs and benefits of protected areas (PAs) is a powerful tool for cultivating policy and financial support. But how, exactly, do we put a price on a wild, unfettered place? And in the face of rising management costs, where do we send the bill?

## Bean counting: why bother?

Take a moment to view a park through the eyes of a finance minister of a developing nation, or as the CEO of a resource-based conglomerate. Chances are you see more red than green. Income from PA visitation and extractive use (if allowed) rarely matches management expenses, and most PAs thus draw on precious government funds. Likewise, restrictive-use policies for PAs may seem to present more lost opportunities than benefits for the agriculture, forestry, fishing, mining and energy sectors.

### *Facts and figures*

- The value of all global ecosystems is estimated at some US\$33 trillion per year.
- Nelson's Dockyard National Park in Antigua was established in 1984 with an initial infrastructure investment of approximately EUR20 million. In 2000, the local conservation value of the 3,885-ha park was estimated at US\$26.5 million per year.
- In St Lucia, one third of the country's fishing grounds were designated as no-take areas in 1995. Within three years commercially important fish stocks had doubled in the seas adjacent to those reserves.
- In Costa Rica, annual tourism revenues of around US\$330 million more than cover protected area outlay of US\$12 million per year.
- Recent studies indicate that Canada is expected to create CDN\$6.5 billion dollars in annual GDP from the expenditure of participants in wildlife-related activities, which sustain 159,000 jobs and creates CDN\$2.5 billion in tax revenue each year.
- Australia receives over AUS\$2 billion in expenditure from eight national parks – at a direct cost to governments of just some AUS\$60 million.



The trouble is that most accounting systems do not account for the 'free' goods and services that PAs provide. Many people, farms and hydroelectric projects depend directly on clean water sourced from protected catchments, yet the values of these inputs are rarely quantified. Indirectly, we depend on PAs as carbon sinks and climate regulators, but the costs to mitigate loss of these benefits may be incalculable.

Yet other park provisions – pharmacopoeia for traditional foods and medicines, repositories of scientific wonder, refugia for ancient spirits and stressed-out city-dwellers – mean something different to everyone. It seems we could not possibly assign euro or kwacha values to these qualities. Yet in some cases, very clever economists try.

At what expense do we not weigh the costs and benefits of protected areas? The ultimate loss is that the area will not be protected, due to poor support from government, the private sector, local people and the international community.

Economic valuation, however, offers two key advantages to help protected areas thrive. With regard to development planning, valuation describes PAs in terms most readily acknowledged in regional-scale planning efforts. Besides enhanced policy support, this acknowledgement may lead to direct funding of PA management through government and private sectors that would not typically support conservation *per se*. And with regard to conservation planning, valuation helps PAs predict and prioritize management costs and develop ways to support them. Clearly, a PA with proven economic value becomes a stronger candidate for conservation funds from government, non-governmental and intergovernmental agencies. Many donors, in fact, now insist upon economic analysis before considering support. Very often, too, managers discover that significant PA value remains uncaptured, but may be compensated, for instance, by park visitors willing to pay higher entrance fees or by municipal water users ready to pay a levy in support of watershed protection.

## A valuation primer

Accounting for the tangible and intangible values of protected areas is a daunting task—one that is best broken down into two discrete steps: 1) identifying the relationships of protected areas to economic factors, and 2) quantifying those relationships.

*Identifying links between protected areas and economy*

The past 20 years have seen expanding recognition for the variety of costs and benefits incurred by protected areas. Whereas assessors once tallied up only direct use benefits like timber, wild game and recreation, the balance sheet has now grown to include non-market values (including biodiversity), environmental services (such as erosion control) and even ‘non-use benefits’ (the intrinsic value of PAs to people who will never visit or physically benefit from them).

Likewise, costs beyond direct management costs are now brought into the equation, as assessors predict the impacts of natural damages and lost opportunities for development and extractive use. Collectively, these costs and benefits are seen as representing the total economic value (TEV) of a protected area, a model which has gained broad general acceptance (see box).

In its details, however, the model is highly site-specific. The initial steps of PA valuation will generally demand close collaboration of economists with ecologists, who can best identify and quantify a complex array of environmental services.

*Quantifying costs and benefits*

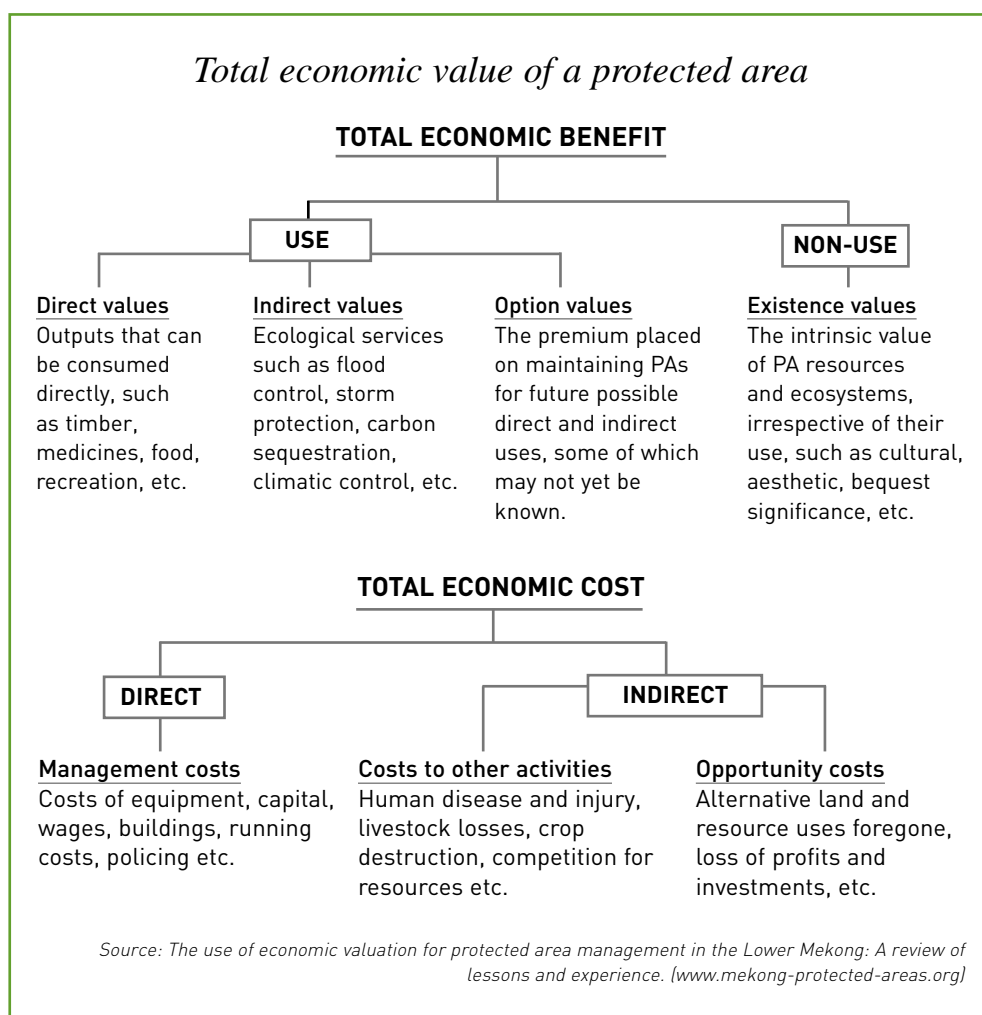
As new definitions of PA costs and benefits have emerged, so, too, have new techniques for measuring them.

Studies that evaluate simple market-based values for PA goods and services, such as the direct values of tourism revenues or harvested foodstuffs, are still used as simple, straightforward

assessments. Broader studies, however, look to proxies to estimate values of goods and services not actually bought or sold. For instance, economists may consider the replacement cost of a PA service if that service were no longer available and an alternative were required. The cost of petroleum-based power generation then gives a lower estimate for the value of watershed protection services afforded to a hydropower station. Other proxies include assessments of PA services as partial contributors toward production of marketable goods, or toward avoidance of damage or mitigative costs.

Clearly many PAs have tremendous recreational value. But is this value adequately reflected by user fees paid at the park gate? Economists believe not, and to better assess the personal values that visitors place on PAs, they may take into account the time and expenditures made for each visit. By tallying up travel costs such as transport, food, accommodation and time spent, and by comparing these costs to visitation rates, economists construct demand curves to estimate total recreational use values. One recent study concludes that entrance fees to PAs typically amount to just 0.01 to 1 per cent of what visitors pay to make the trip.

But how to get a handle on non-use values? What’s the value of a wild macaw in Peru to a housebound bird-lover in the United Kingdom? So called ‘existence values’ (the intrinsic values of PA features) and ‘option values’ (the unknown, future values considered worthy of conservation today) are estimated using a contingent valuation method. Surveys assess the hypothetical willingness to pay to protect a park resource. Similar surveys are used to predict the effects of park fee increases on visitation rates and park tourism revenue.



**Making the most of valuation**

Rising awareness of the value of protected areas is driving some managers to see their resources in the broader context of market forces. Around the world, park managers are rethinking recreational user fees, and land managers of all sorts are implementing other means of generating revenue based on the ‘user pays’ concept. A recent study by the International Institute for Environment and Development identified 280 actual and proposed payment plans for environmental services. Herein, a few highlights:

*User fees used locally*

Some parks now charge recreational user fees more in keeping with guests’ ambitions to visit them, and endeavour to keep most funds on-site. The 1999 Special Law on Conservation and Sustainable Development of the Galapagos Islands established a sliding scale entrance fee for the

## Benefits and costs of protected areas with direct market equivalents

### Benefits

Tourism  
Natural services  
Water production  
Mitigation of natural disasters  
Fish breeding  
Hunting and gathering  
Commercial activities

### Costs

Operating costs  
Natural damage  
Displaced economic activities

Source: IUCN, 1996. *Economic Assessment of protected Areas: A Park Manager's Guide and Guidelines for Assessment*

park that ranges from US\$6 for Ecuadorians to US\$100 for most foreign adults. Fully 50 per cent of tourism revenue is dedicated to park management and enforcement of the surrounding marine reserve.

Not every park, however, can justify such steep price hikes. In 1995-96, researchers used a contingent valuation survey to predict that maximum revenue at Indonesia's Komodo National Park would be generated by increasing gate fees some 15 times above the existing rate of about US\$0.90. Assessment of local spending patterns, however, indicated that the reduced number of guests could have a negative impact on local economy equivalent to the increased park revenue. Though fee hikes are now planned, managers expect to introduce these gradually over the course of several years.

### Tradable credits

By setting a regulatory cap on pollution and other environmental impacts, governments and intergovernmental institutions lay the groundwork for a market in individual quotas. This is the reasoning behind the Kyoto Protocol's Clean Development Mechanism, whereby carbon sequesters (e.g., forests) in developing nations represent 'carbon credits'. Credits may then be leased to offset carbon gas emissions in excess of quotas in developed nations. Though the system holds promise, and offers great potential benefits to forest parks, the scale and complexity of the negotiations are such that agreement to terms, let alone implementation, is slow-going. On smaller scales, tradable salinity credits in Australian drainage basins and nutrient trading in certain US states offer interesting models, as do tradable development credits offered through wetland mitigation.

### Transfer payments

Transfer payments are centralized or brokered payments made to land managers to protect environmental services. Costa Rica provides the classic case study with its Payment for Environmental Services programme (PSA), coordinated by the National Fund for Forestry Investment (FONAFIFO). Similar programmes follow suit in Ecuador, Columbia, Nicaragua, Mexico, Dominican Republic and El Salvador. In Costa Rica, payments are made to

land title holders – most commonly private farmers, though NGOs and indigenous groups may also participate. Title holders are paid US\$538 per hectare over the course of five years for reforestation or US\$210 per hectare over five years for forest conservation. As of 2002 in Costa Rica, 200,000 hectares were under contract for PSA and another 800,000 were pending.

### Coasian bargains

Coasian bargains are voluntary contractual agreements between the user of an environmental service and the manager of the resource providing that service. Unlike transfer payments, they are direct agreements and do not involve centralized control by governments or other regulatory bodies. In 1999, Costa Rica's La Esperanza Hydroelectric Project and the Monteverde Conservation League (MCL) forged a coasian bargain that attracts growing interest. The dam managers contracted to pay the MCL – a private landowner – to safeguard the watershed that protects the dam and turbines from over-sedimentation and flash floods. The 99-year contract provides the MCL roughly US\$30,000 each year to manage 3,000 hectares of forest. Exact compensation is linked to power output and unit power selling price, thus boosting the positive incentive for effective watershed management. When terms can be clearly established, coasian bargains offer a cost-effective means to negotiate environmental protection without need for expensive brokering and outside intervention.

### Bioprospecting rights

INBio, the Costa Rican National Biodiversity Institute, has the mission of cataloguing and conserving Costa Rica's biodiversity. Merck, the world's largest pharmaceutical company, has an interest in tapping that biodiversity for new drugs. In 1991, the scientific NGO and the US corporate giant signed a contract that advanced one another's aims and spurred hope about the emerging field of bioprospecting. In exchange for an up-front payment of US\$1 million, INBio provided biological samples to Merck for drug activity testing. In the event that drugs were developed based on discoveries, INBio would share an unspecified percentage of royalties on net profits. The contract specified that 10 per cent of the up-front funds and 50 per cent of future royalties would go to Costa Rica's national park fund. Though the project failed

to find promising drug material, the agreement established an interesting model for cultivating revenue from raw biodiversity.

Indeed, these are just a handful of innovative schemes linking environmental services with market forces. Many of these strategies have blossomed in the last decade and, with the exception of recreational fee revisions, implementation in nationally managed protected areas is rare to non-existent. In light of growing demands for financial sustainability of PAs, it seems that a prime challenge for the next decade is to close an obvious gap: marry the lessons of economic valuation with compensation for environmental services. Herein lies the clearest course for helping protected areas capture their worth.

*Djuna Ivereigh is a freelance journalist based in Indonesia.*

**"And, by the way, who estimates the value of the crop which nature yields in the still wilder fields unimproved by man? The crop of English hay is carefully weighed, the moisture calculated, the silicates and the potash; but in all dells and pond-holes in the woods and pastures and swamps grows a rich and various crop only unreaped by man."**

*Henry David Thoreau, Walden (1854)*