2. Protected areas as development assets

A synthesis of economic lessons

Section 1 Introduction

The term "protected area" covers a wide range of land and aquatic tenure that allows for varying intensities of conservation and use. IUCN – The World Conservation Union classifies PAs according to six categories, ranging from areas with highly restricted activities (such as scientific research) to areas of multiple use, sequential use and sustainable resource extraction.

Together, the four countries of the Lower Mekong region – Thailand, Cambodia, Laos and Vietnam – have more than 15 per cent of their area in national systems of protected areas and the proportion of PAs is increasing. Over the next ten years this proportion is likely to reach 25 per cent in Cambodia, Thailand and Lao PDR, with major additions in Vietnam as well as in Myanmar and China's Yunnan Province. This extraordinary reservoir of biological and cultural resources is critically important to economic development in the region.

In general, development planners in government agencies have not considered the full economic value of PAs. Because PAs are seen as having little economic or development value and generating few obvious financial benefits or public revenues, they have been given a low priority in development plans. All too often, PAs have been seen as areas that "lock up" valuable resources, deprive local communities of livelihoods, and drain national and local budgets to cover their management costs.



In reality, PAs can be important contributors to economic development. A more thorough economic analysis of the functions of PAs – utilising techniques of environmental and natural resource economics developed in recent decades – can assist the policy and planning process in several important ways:

- demonstrating that PAs are productive assets in the economy;
- identifying and assessing the economic values of PAs and biodiversity;
- integrating PAs in economic development planning at the national level;
- coordination of PA management with sectoral plans and development projects;
- specifying incentive and financing mechanisms for PAs;
- encouraging sustainable management of PAs and economic activity at the local scale; and
- defining institutional arrangements for planning, implementation and follow-up actions.

This chapter demonstrates the importance of PAs in economic development. It is intended to help raise awareness of the economic importance of PAs and strengthen the financial support for their effective management. It is also intended to encourage more integrated approaches to development planning involving PA agencies and managers, national economic development planners, community development planners and planners responsible for sectoral development projects and plans.

This series of lessons on the importance of PAs in economic development is based on experience with PAs over the last few decades in different parts of the world. It draws on and provides a synthesis of the three more comprehensive economics chapters in this volume.

Section 2

PAs and economic policy

Protected areas need to be integrated with various types of development policies and plans, including the following:

- national development plans (e.g. five-year plans in Vietnam, Thailand, Indonesia and Bangladesh);
- sector-specific plans;
- development projects, such as tourism programs, hydro-electric schemes and irrigation initiatives;
- programs of natural resource extraction, such as non-timber forest products and fish catches; and
- statutory planning and assessment procedures, including land-use planning and environmental impact assessments.

Achievement: Recognition of the connections between PAs and sustainable development has increased over the last decade.

In 1987, the World Commission on Environment and Development drew attention to the economic values of the protection of species and ecosystems. Planners are gradually becoming aware of the economic significance of the environmental goods and services that PAs provide, and the costs that can be incurred if PAs and natural resources are mismanaged, especially in developing countries that depend on their natural resources.

Challenge: Development planning methods and procedures — and the institutional arrangements to implement them — still do not fully consider the contributions that PAs can make to the development process.

Much of the economic planning and evaluation that is undertaken focuses on the short-term, direct financial benefits of development. The indirect functions of PAs and natural resources, such as their contributions to fisheries, forestry and water supply — as well as broader ecological functions, including carbon sequestration, biodiversity conservation and salinity control — have not received adequate attention.

Economic assessment

Achievement: A wide range of economic assessment methodologies has been developed and applied that establishes the economic values of PAs and the connections between PAs and regional economic development.

The tools of economic analysis include valuation techniques that demonstrate the value of goods and services (both marketed and non-marketed) provided by PAs, to be incorporated in project planning, environmental impact assessments and regional development planning. Such valuations are now often required for economic appraisals of development proposals by treasury and finance departments, and by international funding organisations.

Economic input-output techniques – established by Nobel Prize Winner, Wassily Leontief (1986) – have been used to analyse the regional economic implications of expenditures associated with PAs, such as tourist visits, commercial fisheries and investments in infrastructure in national parks. In Australia, the regional impacts of activities on the Great Barrier Reef have been assessed by Driml (1987) using these methods, and similar analyses have assessed the regional economic development significance of Kakadu National Park (Knapman et al. 1990, Knapman et al. 1991).

Decision support systems (DSS) are another useful tool for economic development planning, especially participatory planning involving local stakeholders. These systems include multiple-objective planning and multi-criteria analysis (MCA). MCA has been used by Janssen and Padilla (1996) to evaluate management alternatives for mangrove forest in the Philippines, as well as many other applications in natural resource management.

Challenge: Using new economic tools is restricted by limited information about and skills in PA planning and management.

Assessment and planning methods based on input-output models require a detailed data base, which is not always available. It may, however, suffice to identify only some of the key connections, based on partial data, engineering or other physical information (e.g. employment associated with park activities and key supplies to parks). Sanjayan et al. (1997) compiled a useful table from the India Ecodevelopment Project, with examples of direct and indirect connections between different economic activities. The table also includes approaches to analysis, objectives, investments and comments on feasibility.

Perverse incentives

Achievement: Policymakers have become more aware of potential perverse incentives, and their affect on a nation's environment and natural resources, and are gradually eliminating them from policy agendas.

For example, irrigation water has often been supplied to farmers free or at low cost. This encourages profligate use, which in turn leads to waterlogging, salinity and damage to aquatic ecosystems and fresh-water fisheries. Another example is incentives offered for reforestation, which induce land-owners to deforest their land, then apply for the incentives. In some cases, e.g. in Vietnam, this has led to forest clearing in protected areas.

Challenge: Eliminating perverse incentives can be a lengthy and difficult process, and may not be achieved in time to prevent serious damage to PAs and natural resources.

Many obstacles must be overcome. Vested interests, such as land-owners, forest concessionaires and commercial fishers, may not perceive the potential threats to their own livelihoods from resource degradation and instead focus on maximizing short-term gains. Often, these groups often have an influence over government and can slow the processes of economic reform. Within the bureaucracy, procedures for

achieving structural economic change can be costly, time-consuming and politically complicated. Unless these difficulties are dealt with, there will be serious losses in productive capacity and standards of living.

Section 3

PAs and sectoral development

Many of the goods and services provided by PAs to economic development sectors are obtained as "free" inputs to production. Their value is becoming more apparent, and steps are being taken for sectors to provide financial and in-kind support to pay for these environmental services and cover PA management costs. Sectoral planners also are beginning to realise the need to implement appropriate mitigative measures in their development plans and projects.

Achievement: The economic significance of PA goods and services provided to sectoral production is being more widely recognised.

Economic valuation methods have provided a practical basis for this recognition. Goods yielded by PAs include timber, non-timber forest products, fish, wild game, water supplies, and genetic stocks for agricul-tural activities and pharmaceutical products. Services provided by PAs include support for nature-based tourism, education and research, catchment protection, and a wide range of ecological functions including biodiversity conservation and carbon sequestration.

Many different sectors benefit from PA goods and services, either directly or indirectly by PAs:

- tourism (ecotourism, accommodation, transport, retail trade);
- agriculture (water supplies, water quality, genetic stocks, swidden agriculture);
- fisheries (protected habitats for fish nurseries);
- forestry (timber, NTFPs);
- water supply (catchment protection, reduced treatment costs, irrigation, other uses);
- power generation (control of sedimentation in hydro-electric schemes, regulation of flows); and
- industry (reduced water treatment costs, pharmaceutical products).

Challenge: The connections between PAs and natural resource systems are not always taken into account by sectoral agencies.

Line agencies are often single-purpose organisations that focus on development programs and projects only in relation to their own operating objectives. Often, they fail to recognise the benefits their projects receive from goods and services provided by PAs. At the same time, agencies may be capable of enhancing or adversely affecting the flow of goods and services from PAs.

For a variety of reasons – lack of awareness, inadequate information, deficient economic assessments, lack of bureaucratic clout, scarcity of support funding – national agencies responsible for the environment protection and administration of PAs are often reactive rather than pro-active within the sector development planning process. These difficulties are exacerbated by a lack of understanding of the full economic value of PAs. The fact that a single agency may be responsible for establishing and managing PAs does not guarantee that they will be established or effectively managed. Successful integrated plans are likely to result only where there is effective communication and collaboration between PA planners and managers and other development sectors.

Achievement: Requirements to take account of the benefits of PAs in sectoral development projects have begun to be part of project appraisals and environmental impact assessments.

This has helped justify increased expenditures on mitigation measures in investment projects undertaken by economic sectors. In most countries the potentially adverse impacts of sectoral developments are accounted for through environmental impact assessments (EIAs). Economic techniques are beginning to be applied to identify the economic significance of environmental impacts (James 1994). At the same time, economic appraisals of public sector investments are now commonly required to value the "external effects" of sectoral developments, including possible damage to PAs and the natural environment (OECD 1994, Asian Development Bank 1996).

Major infrastructure projects, such as dams, roads, mines and energy production facilities, are important elements of sectoral development plans, and may have an impact on PAs; for example, where roads or powerlines are constructed through protected areas. In Indonesia, infrastructure projects likely to have adverse effects on PAs are discussed and planned by local and provincial governments, national sectoral ministries and by BAPPENAS (Wells et al. 1999). High-level interventions have been required in some instances; i.e. to prevent a road being constructed into Kerinci-Seblat National Park and to prohibit a coal mining licence in Kutai National Park.

Some sectoral agencies in Indonesia, (e.g. agriculture and public works) have been persuaded to invest more of their resources in areas surrounding PAs and to use PAs as protective buffers for infrastructure such as dams, water reservoirs and irrigation systems. In 1997, local governments received US\$200 million from the central government to support buffer zones and compensate local governments for a loss of revenue from land taxes resulting from the declaration of conservation areas.

Challenge: Comprehensive assessments and spatial planning approaches are often required to achieve a system of representative and ecologically sustainable protected areas.

PA connections with sectoral economic activity and the surrounding landscape can be extensive and may involve cumulative environmental impacts. EIAs — which are mostly project-based — are not a substitute for broader spatial and regional development planning. Similar challenges exist in the establishment of marine reserves and integrated land-use planning involving biodiversity conservation and sustainable farming practices. Economic evaluations of the environmental impacts of sectoral developments need to be part of spatial planning, which in turn must see PAs as an integrated part of a wider landscape of development and resource use.

Cost-sharing

Achievement: Cost-sharing and other transfer payment mechanisms between economic sectors and PAs are emerging that uphold the "user pays" principle for the goods and services provided by PAs.

Some of the benefits of these goods and services can, in principle, be appropriated to support PA management. A good example is the catchment protection provided by PAs for water supplied to irrigators, industry and water supply authorities. Sectors that benefit from such goods and services could be charged a user fee or could share costs to help cover the management costs of PAs.

While markets for watershed protection services are still being developed, there are interesting examples of hydro-electric companies, municipal water supply utilities and irrigation users employing voluntary contractual arrangements, user fees and transfer payments to maintain or improve water quality and quantity. In Costa Rica, the *La Esperanza* Hydro-electric Project is paying Monteverde Conservation approximately \$30,000 per year to conserve the 3,000 hectares of forest above the project's turbines. Similarly, the municipality of Heredia near San Jose, Costa Rica, has instituted an ecological tariff on monthly water bills. The money collected will support forest conservation in the watershed where the city draws its water.

Challenge: Effective ways still need to be found to demonstrate PA benefits to sectoral planners.

These benefits must be accurately valued. Sectoral planners are focused on meeting single-purpose objectives in economic development. They need to be made more aware of the environmental implications and economic significance of proposed plans and projects. Sectoral planners still face the challenge of formulating plans — in collaboration with PA managers — that enhance conservation values, protect areas of high ecological value and, where appropriate, establish arrangements that facilitate financial transfers to support PA management tasks.

Section 4

Valuing protected areas

Recent experience in applying economic valuation techniques to PA planning and management is revealing the significance of PAs as development assets. This can critically influence broad-scale development planning, sectoral development, establishment of priorities for development projects, budget allocations for capital works and ongoing operations, and pricing regimes involving PAs and natural resources.

Total economic value

Achievement: In recent years definitions of economic value have been extended to cover a broader range of goods and services yielded by PAs, including non-use values and environmental services.

The concept of total economic value (TEV) as a measure of the economic benefits associated with PAs emerged in the early 1990s (Pearce and Turner 1990). TEV incorporates direct commercial values associated with PAs, as well as non-market values, ecological functions and non-use benefits. Assessments of the total costs of PAs have also extended beyond direct management expenditures to incorporate indirect and opportunity costs (Hitchcock 2000).

Challenge: Deriving economic values for PAs is limited by a number of practical and ethical considerations.

Valuation is usually incomplete. Some PA benefits will always be non-quantifiable, either because the necessary scientific, technical or economic data are not available or because they include such factors as human well-being or religious or cultural significance, the valuation of which raises serious ethical questions.

In addition, economic valuation does not always address the distribution of benefits and costs. Attitudes to PAs can vary between different groups; for example, international tourists may view and value PAs very differently from local inhabitants. Distributional analysis can make explicit such distinctions and thereby greatly assist decision-making and policy-making processes.

Many economic values of PAs are assessed in terms of peoples' willingness to pay for them. But willingness to pay depends on the ability to pay. Disparities in income between different groups may need to be taken into account when formulating policies to share benefits and costs.

Achievement: Techniques of economic analysis have been developed that provide accurate estimates of the economic values of the goods and services provided by PAs.

Techniques for valuing environmental goods and services originated in the 1970s, but they didn't become part of mainstream environmental economics, or be applied to PAs, until the late 1980s. A growing number of people now apply these methods to PAs, individual species and ecosystems. A useful summary of empirical estimates of PA values appears in "Economic Valuation for Protected Area Management" (Chapter 5).

The economic values of PA goods and services are usually derived in two stages:

- the first stage identifies the connections between PAs and economic activities or other attributes of community value, i.e. the fish nursery functions of a marine PA. This stage usually relies on information from disciplines other than economics, such as science, engineering and ecology; and
- the second stage involves establishing values for the PA goods and services involved.

Challenge: Despite advances in assessment techniques, analysis is not widely carried out by economic planners and PA managers or fully incorporated into development plans and management plans.

Greater use of economic valuation techniques – especially in developing countries – is being hampered by many factors, including a lack of scientific information and modelling capabilities, a paucity of economic skills, inadequate economic statistics and other data, and the absence of a requirement that economic evaluations be part of environmental assessment procedures.

Section 5

PAs and local economies

Development planners often need to deal with the intense adverse economic and social impacts of conservation decisions at the local scale. Structural adjustment programs are an important way of reducing conflict and promoting appropriate local development. They may include projects to enhance local incomes in buffer zones, job creation and retraining schemes and compensation payments. Integrated Conservation and Development Projects can also be designed to diffuse human activity and relieve the pressure of exploitive uses of PAs.

Achievement: Structural adjustment packages have been an effective instrument for restructuring industry activities, relieving local pressure on PAs and providing a basis for the declaration of conservation reserves.

In the late 1990s in Australia, potentially adverse economic and social impacts were associated with the expansion of forest-based PAs under the Regional Forest Assessment (RFA) process. They were mitigated by the Forestry Industry Structural Adjustment Program. Under this program, the timber industry was restructured, with financial assistance from government to improve its value-adding performance. In cases where upgrading operations was not possible and mill closures were unavoidable, compensation payments were made to assist exit from the industry. Ongoing monitoring of forest management in national parks and multiple-use forested areas is to be conducted through regular five-year reviews to ensure that the environment protection provisions of the RFAs are being met.

Challenge: The main limitation of structural adjustment programs is that they require budgetary outlays by government.

In developing countries limited budgets and competing demands for public sector investments make it difficult to allocate funds for structural adjustment. There is also a risk that "one-shot" injections of funds may be interpreted by local industry as permanent support, resulting in ongoing demands for government assistance. Governments can try to operate within existing budgets through ongoing sector programs concerned with training and the provision of public services, targeting them to the communities affected by conservation decisions.

Achievement: The participation of local people in the management of PAs and surrounding areas has been shown to create significant economic and conservation benefits.

Management systems that involve local people and participatory management have been shown to be more effective at maintaining conservation benefits and values than those based on prohibitions and penalties. Arrangements that maximise the benefits of conservation include incentive structures that allow local communities to retain income generated by the sustainable use of PAs and other biodiversity assets. Conditional subsidies may be required to compensate for any divergence in costs and benefits between local and non-local groups (Lutz and Caldecott 1996).

Challenge: Efforts to relieve the pressure on PAs by establishing special projects and creating alternative opportunities for employment do not always have the desired outcome.

Job creation projects can encourage in-migration, increasing the population density and creating new pressures on PAs and surrounding environments. Indonesian experience suggests, though, that the main threat to PAs is not local subsistence activities in cutting timber, hunting and of planting crops; it is illegal activities organised and financed by outsiders (e.g. mining, logging and wildlife poaching).

Achievement: Innovative incentives and funding mechanisms can provide a powerful stimulus to more effective management of PAs and support development at the local scale.

Many different kinds of economic incentives can benefit local communities while protecting biodiversity (Young et al. 1996). These initiatives have the ability to offer PA goods and services through various kinds of markets. Marketing the outputs of PAs can generate funds for PAs and set pricing levels that can alter the behaviour of potential PA users. Incentives are discussed more fully in "Economic Incentives and Protected Areas: Economic, Financing and Market Mechanisms" (Chapter 4).

Challenge: Innovative incentives to improve the protection of PAs and natural resource systems are still in the experimental stage.

Developing countries in particular have adopted them, and other schemes, only to a limited extent. One of the major problems is the limited capacity to monitor and enforce appropriate environmental protection standards and other regulatory requirements.

Section 6

Investing in protected areas

Perhaps the greatest obstacle facing PA agencies and managers is the shortage of funds. Money is required to establish or expand the PA system and to support the operational management functions required to ensure the sustainability of PA goods and services and ecosystem functions.

Investments in PAs are attractive if they can be shown to generate development benefits. The ability to capture economic benefits and translate them into financial flows is critical to the maintenance of a healthy PA system. Various economic mechanisms are available to capture many of the benefits and to make PA budgets part of the financial processes of central government and sectoral agencies. Increasingly, the private sector is seeing the advantage of investing in PAs and natural resource conservation. IUCN has conducted a comprehensive review of funding opportunities for PAs (2000).

Not all development benefits can be realised as income, especially those related to non-use values. Investments in PAs may nevertheless be justified even where the benefits take the form of non-marketed goods and services and indirect benefits of various kinds.

Achievement: It is not always possible to realise a financial return from the goods and services provided by PAs.

In general, it is easier to convert economic benefits to financial returns where markets for PA goods or services either exist or can readily be created. Examples include crops, cattle and wood products. Tourism visits to PAs are another highly marketable service; nature-based tourism is a multi-billion dollar global industry. National parks – such as game parks in Africa and coral reefs in tropical countries – are major tourist attractions and sources of foreign currency (Filion et al. 1994, Preece et al. 1995, Honey 1999, Cartier and Ruitenbeek 2000).

Entry fees and other charges generally do not reflect the full willingness to pay, however, and rarely cover the capital and operating costs of PAs, let alone other unpriced goods and services or compensation for on-site damage (World Resources Institute 2000). Gossling (1999) notes that entry fees to PAs are often less than one per cent of the total cost of a trip, while James et al. (2001) note that PAs in Africa and Latin America are managed on less than \$150 per sq. km, compared with the \$250 considered necessary for effective conservation.

Challenge: The most difficult development benefits to capture are those described by economists as nonmarketed "public goods".

It is either prohibitively expensive or institutionally impractical to establish and maintain markets for public goods, yet they yield significant economic benefits. Further details on the characteristics of PA goods and services appear in "Economic Incentives and Protected Areas: Economic, Financing and Market Mechanisms" (Chapter 4).

Economists generally maintain that the provision of public goods should be supported through budgetary allocations by government or cost-sharing mechanisms to ensure that they are available to the community. PAs are important sources of option, existence, vicarious use and bequest values. People are often willing to pay for the conservation of ecosystems and species without ever intending to use these resources in any way. Instead, they derive satisfaction merely from the knowledge that the relevant ecosystems or species continue to exist. The conversion of option and existence values into "non-user fees" such as voluntary donations or official development assistance can be important components of a strategy to capture the global value of biodiversity.

Achievement: Self-funding of PAs as a basis for investing in PAs is possible and has been achieved in some cases.

A good example of self-funding is the Natal Parks Board (Hughes 2001). The board was established in 1947 as a parastatal conservation body at the provincial level. It is a legal entity separate from the government, but not a private company. Its main function is to manage large mammals in what is now KwaZulu-Natal province. The board earns revenue from sales of wildlife, ecotourism and other activities. Market forces have helped to restore populations of mammals previously extinct within the area, and have led to a significant increase in other endangered species. For example, the number of white rhino has increased from fewer than 50 for the whole of South Africa in 1895 to several thousand in KwaZulu Natal. Almost 3,000 of them have been relocated to other areas in South Africa, Sub-Saharan Africa and other countries. The Natal Parks Board currently earns more than US\$1 million per year from sales of white rhino.

Challenge: Conservation targets must be balanced with adequate production of the outputs that are needed to generate sufficient operating revenue for PA management.

Commercial incentives – especially revenue from the sale of indigenous species and/or from exploitative activities conducted within PAs – may dominate management decisions, to the detriment of other ecological and environmental attributes needed to maintain ecosystem integrity.

Achievement: Private property owners are discovering that they can obtain significant economic benefits by establishing and protecting natural areas and indigenous species on their land.

Marketable economic benefits are being realised through initiatives such as game ranching and commercialised hunting, with favourable effects on conservation. In Natal, for example, wildlife ranching has recently been extended to private lands and has helped restore depleted populations. Game ranching is also taking place in other parts of Africa (van Kooten and Bulte 2000, Barbier et al. 1990).

The protection of natural habitats on private lands, such as wetlands, remnant forests and rangeland ecosystems, has provided a sound commercial basis for farming communities. Voluntary conservation

agreements between land-owners and local governments, designed to protect natural habitat in exchange for concessions on land taxes, are beginning to be put into place.

Challenge: Private land-owners will generally invest in nature conservation only if they see that their investments will generate some kind of financial return.

These returns may not match expectations, resulting in insufficient incentive to protect natural areas. The tax concessions offered under voluntary conservation agreements may not be large enough to encourage conservation management, and may also put a strain on local government revenue.

Part of the challenge is to persuade land-owners — through demonstration projects and agricultural extension services promoting sound land management practices — that sustainable land management is capable of enhancing the production of conventional rural products and achieving good conservation outcomes. Such land management includes regimes of protection.

Achievement: Joint ventures and cost-sharing arrangements between government and private enterprise have produced beneficial results for conservation and economic development.

Various mechanisms have been introduced for cost sharing by government, producers and the local community in situations where they can mutually benefit from production and biodiversity conservation. Cost-sharing initiatives such as investment programs and projects (e.g. tree planting) have been extensively implemented in Australia to reduce soil salinity and create natural habitats (Murray-Darling Basin Commission 1996).

In other cases private enterprise has invested in facilities and environmental enhancement within PAs; for example, infrastructure associated with tourism, to help protect the natural resources that generate much of its revenue.

Challenge: Conservation objectives must not be compromised by commercial pressures in cases where private interests compete with environmental protection.

Commercial pressures can result in poorly controlled development and cause significant damage to natural systems within PAs. Activities established on Thailand's Koh Samet, before it was declared a national park, have expanded without authorisation, resulting in extensive degradation of the local environment. It has proven difficult to restructure commercial activities on the island to enhance and maintain the park values on which they depend. If they continue, uncontrolled degradation of the island's environment is likely to result in a reduction of tourism benefits through fewer visits and lesser willingness to pay for the island's natural amenities. Both the local economy and local ecosystems will lose. Similar examples can be found in other countries.

Section 7 Conclusions

By gaining a better understanding of the functions performed by PAs and the wide range of goods and services they supply to the economy, development planners and PA managers should be able to communicate more effectively. They should also be better able to formulate their plans and actions in ways that are mutually beneficial to development and conservation. Economics offers a framework for evaluating options and achieving sustainable outcomes.

An important requirement is increasing the flow of funds to PAs. This will support effective management and deliver the environmental goods and services that are capable of yielding benefits, both direct and indirect, to local people and the broader community. Mechanisms to increase funding include the marketing of products obtained from sustainable management of multiple-use PAs, more realistic entry fees to national parks, and increased budget allocations by national and provincial governments.

Other possible sources of funding are cost-sharing or other transfer payments by beneficiaries that make use of goods and services provided by PAs free of charge. There are numerous examples of such benefits in fisheries, water supply, hydro-electric power, agriculture and tourism. Unless appropriate funding is made available to support the ecological and economic functions preformed by PAs, the integrity of the natural resource base underpinning sectoral productivity can be expected to decline over time, to the detriment of local and national living standards. If the natural resources protected by PAs are allowed to degrade, the community could face high – and possibly prohibitive – costs to restore their contribution to the economy.

Economic analysis of PAs also establishes a strong case for plans and actions that are more effective in preventing or ameliorating the potentially adverse impacts of development policies, programs and projects on PAs and natural resources. By valuing the potential costs of damage that could be inflicted on PAs by inappropriate developments and "internalising" these values in development decisions, it is possible to demonstrate the economic rationale for protecting or enhancing the ecological integrity of PAs.

Important policy recommendations emerging from these analyses include the following:

- structural adjustment packages and other initiatives to relieve the pressure on PAs by local populations;
- increased allocation within sector program and project budgets to implement better environmental mitigation measures in developments with potentially adverse impacts on PAs;
- the removal of perverse policy incentives that have been shown to contribute to environmental degradation; and
- "user pays" systems to achieve more effective resource conservation within PAs.

The most important challenge of all is encouraging economic development planners and PA managers to improve their understanding of the newer concepts and tools that economics has made available in recent times, and to work collaboratively to achieve outcomes which benefit both economic development and conservation. Governments, NGOs and international organisations have an important responsibility to support the processes of capacity building by assisting in the development of analytical skills and facilitating their application in planning and policy decisions that affect the importance of PAs as productive assets in the economy.

Section 8

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