

3. Integrating protected areas in economic development planning

Section 1

Introduction

Economic planning can take many different forms and at geographic scales ranging from local to global. It includes national plans, sectoral plans, regional or local plans, natural resource management plans, spatial plans, and development project plans. Plans may also need to take into account international or transboundary considerations. PAs are increasingly seen as important contributors to economic development within these planning contexts.

This chapter reviews key achievements and challenges in integrating PAs values and benefits with development planning, serving as lessons that may be applied to countries in the Lower Mekong region.

Section 2

Planning at the national level

Developing countries typically guide their economic development through centralised plans (e.g. five-year plans as in Vietnam, Thailand, Indonesia and Bangladesh) formulated by economic planning agencies. These plans incorporate planning targets, strategies for achievement and financing arrangements. Most national development plans also contain sectoral development plans and frequently, but not always, regional or spatial development plans. Budget allocations by governments, including allocations to PAs and natural resource management, are an important part of national plans.



There is much greater recognition of the potential contributions that PAs can make to support the process of development. National planners have addressed major policy issues:

- how to demonstrate ways in which PAs relate to the overall development planning process;
- who should bear responsibilities for planning, including PA planning and management;
- how the plans of government agencies and other stakeholders can be effectively coordinated to increase potential gains from protected areas and natural resource endowments;
- the type of institutional arrangements that will ensure that plans involving PAs are effectively implemented, monitored and adapted; and
- how incentives for resource protection might be designed to achieve sound economic and conservation outcomes.

Achievement: Economic concepts and methods have evolved significantly over the last decade, creating the scope of effective approaches to the integration of PAs in national development planning.

The tools of economic analysis include valuation techniques that estimate the monetary value of environmental goods and services – both marketed and non-marketed – provided by PAs.

Other techniques include benefit-cost analysis, multi-criteria analysis and input-output models. They have been applied to assess the interactions between PAs and economic activities. The reference list at the end of this chapter lists the many publications that explain how these techniques can be applied in development planning and natural resource management, including the management of PAs. Development assistance agencies and other organisations are helping to increase skills in environmental and natural resource economics in the developing world.

Applications of these techniques have helped to increase the attention given to PA establishment and management in national plans and funding and other support from governments. They have also led to PAs being more effectively reflected in project planning, statutory environmental impact assessments and regional development planning.

Achievement: Demonstrating the full economic values of PAs through the application of economic techniques has provided a basis for persuading economic development planners that PAs are important productive assets in the national economy and can contribute significantly to national development.

PAs make direct contributions to economic development and the Gross Domestic Product by supporting key sectors.

Nature-based and ecotourism, for example, are multi-billion dollar global industries that rely on the establishment and maintenance of PAs. National parks, including 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). The commercialisation of wildlife (e.g. game ranching and commercialised hunting) is another example of direct economic benefit (van Kooten and Bulte 2000).

PAs also contribute goods and services that are not sold in markets but which nevertheless contribute indirectly to national production or have significant community benefit. This includes the indirect values of ecological services supported by PAs, including their role in bio-geochemical cycles and the protection of biological resources, according to de Groot (1997), Costanza et al. (1997), Daily (1997) and Brown et al. (1993). (A full review of economic valuation techniques for PAs, as well as a collation of empirical values, can be found in Chapter 5.)

These economic values help demonstrate the “asset value” of PAs as part of the nation’s capital stock. Environmental economists describe PAs as an example of “natural capital”. Viewing PAs and other natural resources in this way should encourage economic development planners to treat PAs in the same way as any other capital asset in the national economy, and plan investments, budgets and management regimes for PAs accordingly.

Challenge: Despite advances in concepts and methods, techniques that demonstrate the economic values of protecting and conserving natural areas are still not being widely applied by agencies responsible for economic development planning.

Planners with a conventional economic background are not often exposed to environmental and natural resource economics and are largely unaware of the potential for applying them in development planning. There is an urgent need within universities, research organizations and planning agencies for training programs and capacity building in these branches of economics, including practical applications for PAs and natural resource systems.

Challenge: Within national economic planning units there is still a lack of appreciation of the full economic value of PAs as “natural capital” or natural assets of national significance.

For a variety of reasons (insufficient awareness, inadequate information, deficient economic assessments, scarcity of support funding etc.) national agencies responsible for development planning still fail to recognise the full value of PAs as economic units. PA managers have also been slow to take advantage of economic techniques and empirical results in influencing government processes of planning and decision-making.

Achievement: National budget allocations and enhanced funding mechanisms for the establishment and management of PAs have increased in recent years.

In some countries, budgets for PAs have increased, including mechanisms that direct PA revenue back to PAs. In Zimbabwe, for example, until the mid-1980s, revenue from parks and wildlife (safari hunting and elephant culling) managed by the Department of National Parks and Wildlife Management was paid directly to the national treasury. Return payments were typically slow and were bound by conditions. The Communal Areas Management Program for Indigenous Resources (CAMPFIRE) project was introduced to overcome these problems (Child 1996, Hess 2001). Owners of communal land surrounding parks were granted harvesting quotas for marketable game animals such as elephants, Cape buffalo and antelope. The quotas could be sold to safari companies, and local communities can use the revenue for wildlife management. This has proved to be an effective mechanism for changing wildlife from a budget liability to an economically viable asset.

Challenge: Governments generally still have not implemented realistic fee structures for the amenity and environmental services offered by PAs.

This creates the false impression that PAs cannot “pay their way” and thus do not deserve substantial allocations in national plans and budgets. Entry fees and other charges for PAs are usually low or nonexistent; they rarely cover the capital and operating costs of PAs, let alone unpriced goods and services or compensation for on-site damage (World Resources Institute 2000). Gosling (1999), for example, notes that entry fees to PAs are often only 0.01 to 1 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 square km, compared with the \$250 considered necessary for effective conservation.

In situations of national budget constraints and limited understanding of the economic values of PAs, it is unlikely that PAs will receive sufficient funding support from central governments (Dixon and Sherman 1990). Revenues from PAs are often deposited to consolidated revenue accounts and not redirected to the protection and management of PAs.

Achievement: There is greater recognition in national economic planning of the potential impacts of perverse incentives and pricing policies on natural systems and biodiversity.

For example, irrigation water has often been supplied to farmers free or at low prices. This acts as a perverse incentive, encouraging profligate use, which in turn leads to waterlogging, salinity and damage to aquatic ecosystems and freshwater fisheries.

In Australia, the federal government once gave tax concessions to land-owners to clear their land of vegetation as a form of “property improvement”. Devegetation of the landscape caused massive problems with salinity and sterilisation of formerly productive land, and the tax concessions have been abolished. The government now offers financial and other support to landholders, through programs such as Landcare and tax concessions for rehabilitation of vegetation.

Challenge: Dismantling 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 in removing or reducing perverse incentives. Vested interests, such as land-owners, forest concessionaires and commercial fishers, do not perceive the potential threats to their own livelihood from resource degradation and focus instead on maximizing their own short-term gains. These groups are often influential and can slow the processes of economic reform. Within the bureaucracy, achieving structural economic change can be costly, time-consuming and politically sensitive. Unless these difficulties are dealt with, there will be serious losses in productive capacity and standard of living.

Section 3

Sectoral development planning

Sectoral development agencies have not always been aware of — or been made responsible for — the possible interactions of development projects and PAs. They have not considered either the value of contributions that PAs make to sectoral production or the economic costs of adverse impacts. The value of environmental services supplied by PAs as inputs to sectoral production is becoming more apparent, however, and sectors are starting to provide financial and in-kind support to pay for these services and cover PA management costs. Sectoral planners are also beginning to realise the need for mitigative measures in their development plans and projects.

Achievement: Mechanisms are being introduced in some countries to better integrate PA planning and management with sectoral development plans.

Plans to establish and/or manage PAs may overlap sectoral development plans at many different levels. These include the following:

- spatial constraints on permitted activities (e.g. land use zoning for PAs);
- restrictions on exploitive activities within PAs and surrounding areas (mining, logging, river flow regulation, control of fish catches and methods); and
- infrastructure developments (dams, power transmission systems, roads, railways, pipelines, etc.).

Appropriate planning mechanisms are required to integrate all these components.

In Indonesia, BAPPENAS and PHPA have encouraged intersectoral coordination in relation to PAs by means of province-level meetings on PA management and buffer zone development issues (Wells et al. 1999). In some cases provincial coordination committees have been established. The Gunung Leuser and Kerinci-Seblat Integrated Conservation and Development (ICDP) projects have connections with regional planning and development processes at the provincial level, with support from BAPPENAS at the national level. The Gunung Leuser ICDP has an influential coordination committee that includes government ministers and provincial governors. It provides a forum for dealing with intersectoral problems in the context of land-use planning. Road developments within the park have been successfully handled through this arrangement.

Challenge: The limited focus of sectoral agencies often makes it difficult to incorporate PAs within integrated plans that require cross-sector tasks and functions.

The various sectors of the national economy are planned and managed by separate agencies. Line agencies are usually single-purpose organisations. Even though they often rely on the services provided by PAs and are capable of enhancing or adversely affecting PAs, they are not given clear responsibility to build those considerations into their annual or long-term plans. This problem becomes acute when agencies have development responsibilities in PA buffer zones, as many agencies have in South East Asia.

Achievement: There has been progress in introducing the principle of “user pays” for environmental goods and services supplied by PAs to economic development sectors.

For example, markets for watershed protection services are beginning to emerge. Hydro-electric companies, municipal water supply utilities and irrigation users are using voluntary contractual arrangements, user fees and transfer payments to maintain or improve water quality and quantity. The Nam Leuk hydro-electric scheme in Lao PDR includes a special fund for environmental activities within Phou Khao Khonay National Biodiversity Conservation Area. The fund receives by one per cent of energy export revenues. In Costa Rica, the La Esperanza Hydro-electric Project pays the Monteverde Conservation approximately \$30,000 per year to conserve the 3,000 hectares of forest above the La Esperanza 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’s water is drawn. Energy development planners can factor these payments into their budgets and adjust the prices they charge electricity consumers.

Challenge: Progress on sectoral pricing has been very limited, as most PAs still supply goods and services to economic sectors either free or at unrealistically low prices.

Benefits that are bestowed without a financial return for their economic value are known as “external benefits”. The non-payment usually arises because of difficulties in arranging property rights or contractual obligations. To create an appropriate flow of funds back to PAs and to manage them more effectively, the benefits of the “free” or underpriced goods and services must be identified, valued and recognised, and appropriate institutional mechanisms must be put in place.

Achievement: Methods to account for the economic costs of damage to PAs that might be inflicted by sectoral development projects are slowly being introduced.

Environmental Impact Assessments (EIAs) are starting to include mitigative measures in their design and implementation.

EIAs have tended to focus on scientific information and assessment of the site-specific impacts of potential developments. EIAs have been required to assess the significance of impacts, explore alternatives and recommend appropriate mitigative measures. The design of development projects and selection of the best planning option has typically been determined on the basis of least cost. But costs have usually included only those direct financial costs incurred by the developer. This disregards the broader costs (and benefits) that might be incurred, as is the case when development projects have adverse effects on PAs and associated natural resource systems.

Another major weakness of EIA in developing countries is its rigidly site-specific focus. Wider regional and multiplier effects are not taken into account. This ignores potential cumulative and area-wide environmental impacts of development projects as well as potential impacts on the regional economy.

It is now more common for governments to insist on a regional impact analysis and a social benefit-cost analysis (and social impact assessment) as key EIA requirements. This creates new opportunities to apply techniques of economic environmental valuation and other economic assessment methods, including assessing the damage costs potentially inflicted on PAs by sectoral developments and identifying mitigative measures that achieve greater environmental protection. The economic analysis conducted in the EIA on flood control for the Kahawainui watershed in Hawaii ensured that the preferred development option specifically took into account the need to protect special wetland areas and cultural sites (James 1993).

Challenge: An EIA is often just a “rubber stamp” to justify a specific development proposal.

This limits its ability to evaluate the potentially adverse effects of development projects on PAs, explore alternatives for meeting the main project objectives or design appropriate levels of environmental mitigation. An economic analysis – if properly conducted – would typically encourage planners to consider a broader range of planning options. In many instances it could improve the chances of achieving development objectives while at the same time limiting adverse impacts on PAs or enhancing their protection.

Achievement: In some countries sectoral agencies are more effectively integrating the functions of PAs with infrastructure development. This in turn leads to economic benefits from PAs.

In Indonesia, some sectoral agencies (e.g. Agriculture and Public Works) have been persuaded to invest more of their resources in areas surrounding PAs and to use them as protective buffers for infrastructure such as dams, drinking water reservoirs and irrigation systems.

Challenge: Sectoral agencies still tend to ignore the adverse impacts of infrastructure developments on PAs and therefore not take advantage of the potential benefits that PAs can provide.

In many cases, development agencies choose the least-cost option when planning infrastructure. This has led to roads and power lines being routed through PAs, or dams and hydro-electric projects being developed within them. This results in a range of adverse impacts, such as in-migration of squatters, soil erosion, damage to critical habitat and environmentally sensitive areas, invasion by feral species and degradation of scenic values. Greater efforts are needed to persuade agencies that it is economically worthwhile to coordinate infrastructure developments and PAs, even if some higher development costs result.

Section 4

Regional and local planning

Regional economic development plans are formulated either by centralised economic development planners or by regional, district or local authorities. These plans facilitate investment planning by the public and private sectors and help to guide development at the regional and local scale. In recent years, economic development planners have begun to realise that PAs can provide a significant stimulus to regional economic development, generating income and employment. Economic techniques and models are providing frameworks to help formulate regional plans that specifically take PAs into consideration. Models are also being used to facilitate local participation in planning processes.

One of the challenges in regional planning is determining how to take advantage of new opportunities for economic expansion that are associated with PAs and manage any potentially adverse economic and social impacts that might result from structural change in regional and local economies.

Achievement: Economic models are increasingly being used to demonstrate the role of PAs as a stimulus to regional economic development.

Many studies have demonstrated the favourable effects of expenditures associated with PAs on regional economic development. These expenditures include spending by visitors to national parks on tours, accommodation and souvenirs, as well as major expenditures on infrastructure developments within and adjacent to PAs.

The use of regional input-output models, an economic modelling technique devised by Nobel Prize winner Wassily Leontief (1986), has shown that the direct expenditures associated with PAs have favourable “spillover” impacts on the regional economy. These multiplier effects indicate that the total economic impact on a regional economy (i.e. in terms of the value of production, income and employment) can be twice the amount of the direct expenditures.

Driml (1987) has assessed the regional impacts of activities on the Great Barrier Reef in Australia using these methods, and similar analyses have been conducted to assess the regional economic development significance of Kakadu National Park in northern Australia (Knapman et al. 1990, Knapman et al. 1991). The NSW National Parks and Wildlife Service is using input-output techniques to demonstrate the economic importance of PAs and integrate them in regional development planning (Powell and Chalmers 1995, Gillespie 1997, NSW NPWS 1998).

Challenge: Development and application of economic planning models is often restricted by limited information and skills in PA planning and management.

Assessment and planning methods based on input-output models require a detailed data base, and this may not be available in developing countries. The concept of links and multipliers is still relevant, however, and even less sophisticated methods may still achieve some important results. For example, it may suffice to identify only some of the key connections, based on partial data for expenditure flows, or on engineering or other physical data (e.g. employment associated with park activities and key supplies to parks). Sanjayan et al. (1997) have compiled a useful table from the India Ecodevelopment Project with examples of direct and indirect linkages, including approaches to analysis, objectives, investments and comments on feasibility.

Achievement: Tools of economic analysis are creating new opportunities for participatory planning in PA management and for conflict resolution at the local scale involving resource use and conservation objectives.

Many governments are now devolving the planning and management of PAs to local stakeholders. Local "ownership" of the PA planning process and local responsibility for PA management engenders a sense of responsibility for and wiser use of resources. It is important to establish clear planning and management objectives, consider alternative means of achieving them, and assign priorities to alternative strategies or actions based on cost, sustainability, equitable distribution of costs and benefits, ecological integrity and other relevant criteria.

Innovative models have been developed and applied by economists to facilitate participatory planning and decision-making at the local scale. Multi-criteria analysis (MCA) is one such model (Nijkamp 1977; Janssen 1994). MCA is ideally suited to interactive planning processes involving direct participation by experts and/or stakeholders. It helps decision-makers evaluate options and rank them according to a predetermined set of criteria. An important advantage of MCA is that criteria need not be confined to monetary benefits and costs. They can be specified in physical or other units, using various kinds of indicators to measure the performance, effects or outcomes of different planning options. This is particularly important in relation to equity, sustainability and ecological integrity, which are not easily quantified.

MCA was strongly advocated as a participatory decision-making tool in the report recently released by the World Commission on Dams (2000). It has been used, among many other applications, by Janssen and Padilla (1996) to evaluate management alternatives for mangrove forest in the Philippines.

Challenge: The use of economic models to support participatory planning does not necessarily guarantee a consistent or successful planning outcome.

Decision support systems require two kinds of information:

- scientific information that indicates the effectiveness of different planning options to achieve predetermined management objectives. In principle, it should be possible to obtain this information by objective means, but often there are gaps in information or modelling capabilities (for example, the effects of different management actions or development initiatives on natural areas); and
- a set of value judgements about the relative importance of different criteria used to evaluate planning options. Such judgements are subjective and depend on the attitudes and values of different stakeholders.

In some cases, different stakeholder positions make it difficult to reach consensus. “Green” groups typically place higher importance on maintaining the ecological integrity of PAs; stakeholders with a commercial interest tend to consider development opportunities and financial gains to be more important. Facilitation skills are thus an important requirement of participatory planning processes to achieve outcomes that may be acceptable to all stakeholders. These skills are often not available in developing countries.

Achievement: Centralised plans incorporating PAs are being supplemented or replaced with local decision-making and planning arrangements.

This creates a strong inducement for local people to take direct responsibility for their own economic welfare in relation to PA planning and management.

Devolution of planning powers and responsibilities to local communities — driven by strong economic incentives at the local scale — has encouraged more effective planning and management of PAs (Lutz and Caldecott 1996). Financial management is an important aspect of these arrangements. It includes incentive structures that allow local communities to keep income generated by the sustainable use of PAs and other biodiversity assets. Conditional subsidies may also be appropriate, especially where there is a divergence in costs and benefits for local and non-local groups. This may require the national or international community to bridge the gap with appropriate investments or grants. Another component is the delegation of appropriate fiscal authority to local groups or authorities to fulfil their roles in planning and managing PAs. (Incentives and financial arrangements are covered in greater detail in Chapter 4.)

Challenge: The economic interests of local people in planning and managing PAs may not coincide with planning objectives relating to the broader national interest.

Conservation decisions undertaken for national benefit may have detrimental effects on the local economy. In such cases, there may be strong justification for compensatory measures or structural adjustment assistance, financed from national budgets. Alternately, local planning and management decisions may yield local economic benefits, but may detract from broader benefits at the national scale. In a marine protected area, for example, local fishers may advocate an exploitive approach to commercial fish harvesting because it contributes to their incomes, whereas more broadly distributed benefits might be achieved by prohibiting commercial fishing from the area in favour of water-based recreation and tourism. Similar conflicts may arise in relation to exploitive uses of non-timber forest products in PAs.

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

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

In Australia, the potentially adverse economic and social impacts associated with the expansion of forest-based PAs (under the Regional Forest Assessment (RFA) process) were mitigated by the Forestry Industry Structural Adjustment Program. The timber industry was restructured with financial assistance from government to improve its ability to add value. In cases where an upgrade of operations was not possible and mill closures were unavoidable, compensation payments were made to allow people to leave the industry.

Challenge: Budgetary constraints and other factors may limit the scope of structural adjustment packages.

Their success depends on how they are designed and implemented. They may involve special funding arrangements, or may be delivered by coordinating existing support services and national programs. In developing countries, the latter may be more feasible.

Another potential limitation in developing countries is the competition for available funds. Budget planners should bear in mind that one-off injections of funds to support a process of structural adjustment may be interpreted by local industry as permanent support. This results in ongoing demands for government assistance.

Section 5

International and transboundary economic planning

The economic benefits of PAs can be international in scale. Benefits include tourism revenues, potential returns from genetic stocks and global ecosystem functions. Cooperative planning at the global scale, as well as on a multi-country and bilateral scale, can facilitate the generation and appropriation of such benefits. Not all countries will gain equally, however. Inter-country transfers of benefits or compensation payments may be needed to achieve international agreements.

Achievement: Inter-country agreements on economic development and protected areas can enlarge the scope for joint economic benefits that can be shared on an equitable basis.

International agreements on PAs for fisheries, for example, demonstrate that effective planning can generate economic benefits. The economics literature convincingly explains why “open access” resources such as fish stocks tend to be overexploited, and how the introduction of management controls — such as catch quotas, gear restrictions and seasonal closures of fish breeding grounds — can enhance fish stocks, promote sustainable yields and meet conservation objectives (Munro and Scott 1985).

Challenge: Countries often pursue their own national interests in exploiting PAs and natural resource systems, instead of equitably sharing the joint benefits that can accrue from integrated multi-country management.

According to the World Resources Institute (2000) the potential hydro-electric generation capacity of the Mekong River has been estimated at 30,000 to 50,000 MW. Only five per cent of this potential has been realised. In China, Yunnan Province is planning to construct up to 14 dams on the upper Mekong, with a capacity of 7,700 MW; Laos plans to construct up to 17 new dams for hydro-electric generation. Thailand has already built hydro schemes on the Mekong and is currently planning to divert water from the Mekong to the Chao Praya River for irrigation and other purposes (World Resources Institute 2000, Mekong River Commission 1997). These developments pose serious threats to biodiversity and protected area systems in the Mekong River Basin.

According to WRI, 30 per cent of the 55 million inhabitants of the Mekong River Basin live below the poverty line and most of the rural population is dependent on the river system. Fish catches from the Mekong account for up to 60 per cent of the animal protein consumed by the population. It is of great importance that the Mekong countries cooperate in establishing PAs for the riverine system to protect native fish stocks and to maintain adequate river flows and water quality for the multiplicity of dependent uses. A coordinated approach, involving multi-country agreements, is essential to protect the environmental systems of the Mekong River Basin and their associated economic and social impacts.

Achievement: Making the international community more aware of the global benefits of PAs has enhanced the prospects for obtaining economic support for the establishment and management of PAs in developing countries.

Developing countries have made increasing use of international aid programs and other sources of funds to support PAs and their management. Many projects and development strategies in developing countries, especially those targeted at improving the natural resource base and conserving ecological assets, are being planned with the assumption that international financial support will be made available.

Funds may be provided through the Global Environmental Facility (GEF) and by multilateral and bilateral donors. Debt-for-nature swaps are another international mechanism for establishing PAs. Under this arrangement, a developing country agrees to meet certain conservation objectives in return for the cancellation of its outstanding foreign debt to the donor country. Another prospect is establishing protected areas, especially forests, as a means of earning carbon credits under the Clean Development Mechanism (CDM), although this is still under consideration.

Challenge: Developing countries may rely too much and for too long on international support.

Experience indicates that when international funding runs out, ongoing protection may become compromised because developing countries have not taken adequate steps to maintain their PAs through national budgets. According to Wells et al. (1999), as of late 1997 foreign donors contributed 15-20 per cent of the Government of Indonesia's annual PA budget. There is continuing expectation of even greater foreign support. If this support is not forthcoming, the system of PAs may not be effectively maintained. In the interests of achieving sustainable development and protection of the environment, it is important for developing countries to include strategies for achieving independent management of natural resources in their long-term economic development plans.

Section 6

Conclusions

Economics offers a range of tools and planning techniques that can help integrate PAs in national and local development policies and plans. They include indicative planning and assessment methods used at the national scale, as well as more detailed techniques, models and approaches that can be applied at the regional or local scales.

Applications of economic methods in sectoral and project planning are creating new opportunities to incorporate the interactions between PAs and economic development. They measure the potentially adverse impacts of development on PAs and natural resources in economic terms, and outline the potential contributions that PAs can make, both directly and indirectly, to the development process.

Incorporating economic valuation and assessment methods in EIAs – even though slow to occur in many developing countries – is another way to integrate PA values in economic planning. It allows planners to anticipate the potentially adverse impacts of development on PAs and ensure that they are prevented or mitigated. At the local scale, the use of decision support systems and other operational models drawn from environmental economics is providing new ways to conduct participatory planning and decentralised management decision-making. Such tools are particularly useful in ranking options for PA planning and management.

Despite these achievements, significant challenges remain. Wider adoption of these economic models and methods is necessary. Impediments to more effective planning include inadequate information and modelling capabilities and a shortage of skills in economic planning agencies. Institutional constraints inhibit agencies from taking an integrated approach to development planning, one that fully recognises the major contributions that PAs can make to national economic development.

In many cases, economic planners are unfamiliar with the newer concepts and methods of environmental and natural resource economics. PA planners and managers generally appear to be even less aware of these innovations. Extensive capacity-building is required, as is increased application of relevant techniques and results in development planning processes.

Section 7

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