



# Valuing Nature:

## *Why Protected Areas Matter for Economic and Human Wellbeing*

### **INVESTING IN NATURE FOR ECONOMIC DEVELOPMENT**

Human wellbeing across the globe depends intimately on the state of natural ecosystems, and any threat to nature runs the risk of imposing untenable economic costs to almost every sector and social group.

Far from being a luxury that governments and the international community cannot afford, nature conservation is something that they cannot afford not to invest in. It is absolutely fundamental to sustaining human development, now and in the future.

Unfortunately, nature is rarely appreciated as a productive economic asset which is a valuable public good and therefore requires high public investment. The flows of funds and other resources which are allocated to conservation remain pitifully low. In many cases they are actually declining.

The Nature Conservancy has been working to set the record straight. Eleven studies are being carried out to compile information about how some of the world's richest countries in biodiversity terms also generate immensely valuable goods and services – locally, nationally, and even at the global level.

The evidence that has been uncovered points to a clear conclusion. Investing in conservation yields tremendously high development returns, and there is little doubt that continuing to under-value nature will prove extremely costly in economic terms, not just for biodiversity-rich countries, but for the whole world.

# The protected area funding crisis

The world's protected areas are facing a funding crisis. Although nearly 12% of the land's surface area has been set aside for nature conservation, only around a quarter of these protected areas are under active management<sup>1</sup>. Nature of inestimable value is being lost. The recent Millennium Ecosystem Assessment reveals that all of the earth's ecosystems have been transformed through human actions, and that approximately 60% of the ecosystem services worldwide are being degraded or used unsustainably.

There are many reasons for this neglect, but one of the most serious is a lack of funds. The 1990s saw a worldwide downward trend of investment in nature conservation by governments, overseas donors and development banks. This decline continues apace, resulting in a situation where, today, protected area managers in most parts of the world lack sufficient finances to conserve biodiversity effectively (Figure 1). It is thought that at the very least an increase in funding of \$2.5 billion a year is needed just to cover the basic expenditures of running existing protected areas<sup>2</sup>.



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The total amount required to ensure effective nature conservation across the globe is far higher than this. A particular concern is that protected areas have lost out as government budgets and donor spending have been realigned towards sectors which are seen as making

a direct contribution to development goals. Eradicating poverty and stimulating economic growth has, very justifiably, become the main priority when budgets are allocated. A common misperception however persists, and continues to push protected areas off the funding

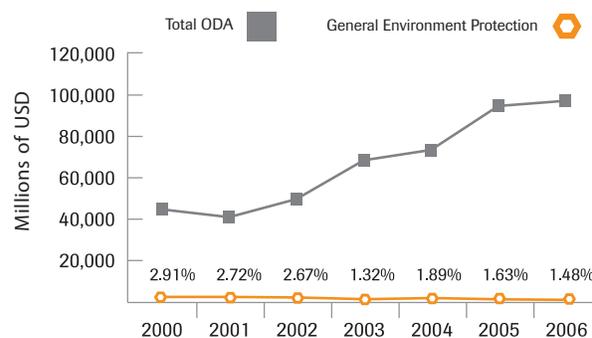


Figure 1: ODA for Environmental Protection (2000-2006)

agenda – that nature conservation and economic growth are two irreconcilable and mutually exclusive alternatives. It is frequently argued that, in the face of pressing and ever more urgent needs for human development, it must always take a higher priority in public investment and spending.

In fact, nothing could be further from the truth. As The Nature Conservancy's studies show, conservation and development are inextricably intertwined – and any loss of nature is also a cost to economic and human wellbeing. Nowhere are these linkages more apparent than in biodiversity-rich countries, where the wellbeing of entire nations is so closely tied to the state of nature. This is especially important given that many of the world's biodiversity-rich countries also contain some of the highest rates of poverty, and face some of the most urgent development challenges. Failing to understand that there is growing evidence that protected areas can contribute to reduce poverty, strengthen livelihoods and sustain economic growth, leads to the risk of incurring far-reaching economic and development costs – especially for the poorest and most vulnerable sectors of the world's population.

<sup>1</sup> Pabon-Zamora, L. and Cohen S. (2007) Making the Case Campaigns for Protected Areas: Assessment, communications and advocacy work around social and economic benefits of protected areas. The Nature Conservancy, Arlington, VA

<sup>2</sup> Bruner, A., Hanks, J., and Hannah, L. 2003. How Much Will Effective Protected Area Systems Cost? Presentation to the Vth IUCN World Parks Congress, 8-17 September: Durban, South Africa.

# Protected areas, economic growth and human wellbeing: *some key values*

## SUSTAINING THE NATIONAL ECONOMY

Nature typically makes a substantial contribution to national economies – although these values almost always remain “hidden”, as they are not reflected in official statistics. For example, development data show that forests contribute 1% to 2% of GDP in Indonesia, whereas the World Bank estimates that the real value of forests to that economy is closer to 15% to 20%<sup>3</sup>. Analysis of the full value of forest protected areas shows that they contribute, directly or indirectly, to three quarters of Lao PDR's per capita GDP, more than 90% of employment, almost 60% of exports and foreign exchange earnings, just under a third of government revenues, nearly half of foreign direct investment inflows and around two thirds of donor assistance.

The studies provide many examples of the high, although largely unrecorded, importance of biological resources for national economies. In Indonesia, for example, marine fisheries were found to generate income worth more than \$3 billion a year, produce almost 5 million tonnes of food (the primary source of dietary protein for more than half the population), and create jobs for around 4 million people (just under 5% of total employment). Similar statistics can be found in other biodiversity-rich countries. The fisheries sector contributes more than



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10% of GDP in Cambodia, the Maldives and Kiribati, and more than 5% in Gambia, Mauritania and Sao Tomé<sup>4</sup>. In all developing countries taken together, the forestry sector provides formal employment for 10 million people and informal employment for another 30 to 50 million people<sup>5</sup>. In Cameroon, the Central African Republic and Liberia, forests contribute from nearly 30% to more than 40% to national exports<sup>6</sup>.



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Tourism is another important economic sector that depends heavily on nature and protected areas. In Indonesia marine and coastal tourism add another 5% of all jobs as well as contributing more than 5% of GDP, 5% of exports and 8% of capital investment. Mexico's tourism industry is the third largest economic sector in the country, with protected areas injecting more than \$600 million in spending and generating around 30,000 jobs. Protected area tourism directly delivers 0.5% of GDP in Bolivia. In the Maldives, marine and coastal tourism directly accounts for 20% of GDP and its wider effects help produce 74% of national income; it contributes more than 60% of foreign exchange receipts, over 90% of government tax revenue comes from import duties and tourism-related taxes, and almost 40% of the workforce is employed in the industry<sup>7</sup>.

<sup>3</sup> OECD, 2008, Pro-Poor Growth and Natural Resources: the Economics and Politics. Development Cooperation Directorate, Development Assistance Committee, Organization for Economic Cooperation and Development, Paris.

<sup>4</sup> OECD, 2008, Pro-Poor Growth and Natural Resources: the Economics and Politics. Development Cooperation Directorate, Development Assistance Committee, Organization for Economic Cooperation and Development, Paris.

<sup>5</sup> OECD 2008 op. cit.

<sup>6</sup> OECD 2008 op. cit.

<sup>7</sup> Emerton, L. 2006. Counting coastal ecosystems as an economic part of development infrastructure, Ecosystems and Livelihoods Group Asia, World Conservation Union (IUCN), Colombo; WTTC, 2005, Media and Resource Centre, World Travel & Tourism Council

## UNDERPINNING ECONOMIC PRODUCTIVITY

As well as directly contributing valuable resources, nature conservation also indirectly supports the productivity of key sectors and industries. In Lampung Province in Indonesia, each additional kilometer of coral coverage leads to a rise in fish productivity of more than 2 tonnes. Similar calculations from the Baluchistan coast of Pakistan estimate that mangroves are responsible for providing the nursery and breeding habitat upon which up to a half of off-shore commercial fish yields depend<sup>8</sup>. Healthy coral reefs in Southeast Asia have been found to increase fish productivity by more than 10 tonnes per square kilometer per year<sup>9</sup>. The insects which pollinate crops are estimated to contribute more than to €153 billion a year, which represents 9.4% of the value of world agricultural production used for human food<sup>10</sup>.

Water is perhaps the most fundamental of all requirements for human survival and economic growth. In all four of the countries studied, protected areas help to secure water supplies for human consumption. They add value through improving water availability and reliability, as well as generating savings because they reduce water shortage and maintain water quality. In Mexico, for example, the value of water supplied by protected areas is estimated at between \$150 million and \$300 million a year for urban, industrial and agricultural consumers. In

Venezuela, 83% of the population receive water from sources that are protected by National Parks, which supply more than 530 liters per second. The hydropower energy generated is equivalent to 575 barrels of oil as day or 23% of national oil production, worth \$12.5 billion a year or a quarter of the entire national budget. In Bolivia more than 1.5 million city dwellers depend on water supplied from protected areas<sup>11</sup>.

## SUPPORTING LOCAL LIVELIHOODS

The economic value of nature and protected areas is perhaps the most significant at the local level – the communities who live in biodiversity-rich areas are often marginalized from the mainstream economy, and few other sources of income and subsistence are readily available or affordable for them. The substantial role that nature plays in household livelihoods was underlined again and again in the studies. Between 30% to 50% of local employment opportunities in areas around Venezuela's national parks are for example provided from the tourism they attract. In Indonesia, marine and coastal ecosystems provide for the livelihoods of well over 60% of the population. In Bolivia, park-adjacent communities engage in a huge variety of sustainable resource harvesting and trade activities. In many instances these sources of income and subsistence provide for the bulk of livelihoods – households can, for example, double their income through producing vicuña wool.



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<sup>10</sup> Gallai, N., Salles, J.-M., Settele, J. and B.E. Vaissière, 2007. Economic valuation of the vulnerability of world agriculture confronted to pollinator decline. Draft manuscript, Institut National de la Recherche Agronomique, Paris.

<sup>11</sup> Pabon-Zamora, L., and Escobar, J (2009). El Aporte de las Areas Protegidas a la Economía y a la Sociedad Boliviana. Document unpublished. FUNDESNA, Bolivia.

These findings are replicated in and around protected areas across the globe. One important livelihood benefit that protected areas provide is to sustain household nutrition and food security. It has for example been found that the wild foods obtained from forests and protected areas provide contribute between 61-79% of non-rice food consumption by weight in Lao PDR, and non-timber forest products alone comprise nearly half of household subsistence and cash income. In the Democratic Republic of Congo, wild foods comprise around one third of household production. Wild meat, fish and plants contribute 3%, 6% and 10% respectively to the total value of the food consumed in the household, corresponding to 0.04 kg/day, 0.06 kg/day and 0.11 kg/day respectively. They also make an important contribution to household income, thus indirectly increasing food security, generating twice as much for household sales as crops<sup>12</sup>.

The economic significance of biodiversity-based medicines and healthcare is also in most cases substantial, both in terms of market values and savings on purchases of bought drugs, but also in relation to the benefits of health improvements and disease avoidance. For example, the annual volume of medicinal plant harvest in Nepal was estimated to be around 15,000 tonnes in 1997-98 and to generate export values of more than \$15 million, while involving around 10% of rural households<sup>13</sup>. Earnings from traditional healing practices in Madagascar are thought to exceed \$10 million a year, and involve around 10,000 individuals<sup>14</sup>. In Mtanza-Msona Village in eastern Tanzania (where more than a third of the population live below the poverty line) the local value of woodland and wetland resources is equivalent to just over 37% of GDP, including plant-based medicines which are worth almost 15 times as much as purchased drugs and 'modern' treatment<sup>15</sup>.

It is obvious that nature is of the highest economic significance for the most economically marginalized and vulnerable households: protected area goods and services are often a critical source of support for poverty alleviation. Work carried out in rural Zimbabwe for example shows that biological resources make a significant contribution to the income of most households; however for the poorest quintile their



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relative role is by far the greatest, around 40% of total income<sup>16</sup>. In an urban area of northern Bolivia, it was found that more than half of city-dwellers participated in one form or another in the Brazil nut or Palm heart industries; the poorest income group was most dependent on this source of livelihood, obtaining almost half of their income from it<sup>17</sup>. A study of villages in the Himalaya region found that the poor relied on natural resources for around 25% of their income, as compared to under 5% for the rich<sup>18</sup>. In the Chobe region of Botswana, the poor were found to depend on wild products from common property lands for half their income, as compared to less than a fifth for richer households<sup>19</sup>. In a highland community in the Sierra de Manantlán Biosphere Reserve in Mexico, it was found that collecting and selling of non-timber forest products was almost exclusively undertaken by women; they ranked as the most important source of cash income for 30% of women interviewed<sup>20</sup>.

<sup>12</sup> De Merode, E., Homewood, K. and G. Cowlishaw, 2003, Wild resources and livelihoods of poor households in Democratic Republic of Congo. Wildlife Policy Briefing Paper No. 1, Overseas Development Institute, London.

<sup>13</sup> Olsen, C.S., 2005, Valuation of commercial central Himalayan medicinal plants. *Ambio* 34(8):607-10.

<sup>14</sup> Juliard, C., Benjamin, C., Sassenpou, M., Ratovonomenjanahy, A. and P. Ravohitrarivo, 2006, Madagascar Aromatic and Medicinal Plant Value Chain Analysis: Combining the Value Chain Approach and Nature, Health, Wealth and Power Frameworks, microREPORT #70, United States Agency for International Development.

<sup>15</sup> Kasthala, G., Hepelwa, A., Hamiss, H., Kwayu, E., Emerton, L., Springate-Baginski, O., Allen, D., and W. Darwall (2008) An integrated assessment of the biodiversity, livelihood and economic value of wetlands in Mtanza-Msona Village, Tanzania. Tanzania Country Office, International Union for Conservation of Nature, Dar es Salaam.

<sup>16</sup> Cavendish, W., 1999. Empirical Regularities in the Poverty-Environment Relationship of African Rural Households. Working Paper Series 99-21. Centre for the Study of African Economies, London.

<sup>17</sup> Stoian, D., 2003, Making the Best of Two Worlds: Rural and Peri-Urban Livelihood Options Sustained by Non-Timber Forest Products from the Bolivian Amazon. Paper presented at conference on Rural Livelihoods, Forests, and Biodiversity, Bonn.

<sup>18</sup> Reddy, S. and S. Chakravarty, 1999, Forest Dependence and Income Distribution in a Subsistence Economy: Evidence from India. *World Development* 27(7):1141-1149.

<sup>19</sup> Kerapeletswe, C. and J. Lovett, 2001, The Role of Common Pool Resources in Economic Welfare of Rural Households. Working paper, University of York.

<sup>20</sup> Marshall, E. and A. Newton, 2003, Non-Timber Forest Products in the Community of El Terrero, Sierra de Manantlán Biosphere Reserve, Mexico: Is Their Use Sustainable? *Economic Botany* 57(2): 262-278.

## REDUCING VULNERABILITY TO CLIMATE CHANGE AND OTHER NATURAL DISASTERS



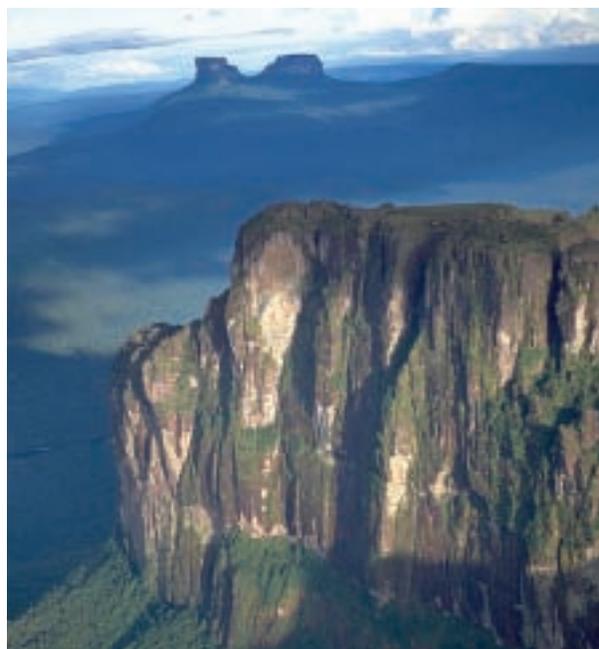
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One very critical value that protected areas provide to humanity is to mitigate the effects of global climate change. This has, over recent years, become one of the highest priorities on the international policy agenda – there are few countries in the world today which are not concerned about the impacts of climate change, and about the immense costs that may arise. Protected areas across the world contain substantial stocks of natural forest, which store carbon. The studies found that protected areas in Bolivia, Mexico and Venezuela together contain around 25 million hectares of forest. These store more than 4 billion tonnes of carbon, estimated to be worth \$39 and \$87 billion in terms of global damage costs avoided.

Protected areas also help to safeguard local communities who are vulnerable to climate change and other types of natural disasters. Because natural ecosystems such as forests, mangroves, wetlands and coral reefs provide physical protection to human settlements and infrastructure, they help to avert the risks of disasters, and minimize their costs. Low-lying zones of Mexico are, for example, threatened by sea-level rise. The study found that National Parks have been established in four out of the five areas which are most vulnerable to these effects. They provide critical, and valuable, defenses against rising sea levels, and buffer against the ever more frequent storms and tidal surges which are being experienced. In Indonesia, another case study country, coral reefs safeguard coastal settlements from storms and wave damage – to an estimated value of \$314 million a

year. In just one area, Bintuni Bay of West Papua, the ability of mangroves to control coastal erosion is worth \$600 per household – almost twice as much as the average cost of building a house.

These types of values are also gained in many other areas of the world. Wetlands in the Zambezi Basin, for example, play an appreciable role in minimizing flooding, leading to avoided private and public damages avoided with a net present value of \$3 million for the communities around the Lower Shire Wetlands in Malawi, the Barotse Floodplain in Zambia and the Zambezi Delta in Mozambique<sup>21</sup>. Each hectare of mangrove forestland in India's Orissa State has been calculated to be worth more than \$8,000 in protecting coastlines and minimizing cyclone damages through lowering the degree of house damage, reducing the incidence of livestock death, and minimizing the destruction of other assets and property<sup>22</sup>. Healthy coral reefs in the Caribbean are estimated to provide shoreline protection services worth between \$2,000/km<sup>2</sup> (in virtually unpopulated areas) and \$1 million/km<sup>2</sup> (in densely settled and developed areas)<sup>23</sup>. Djibouti's pastoralist population relies on emergency foods from woodlands to the tune of some \$2 million in times of severe drought, which generate tangible savings in government and donor food relief expenditures<sup>24</sup>.



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<sup>21</sup> Turpie, J., Smith, B., Emerton, L. and J. Barnes, 1999, Economic Valuation of the Zambezi Basin Wetlands. IUCN The World Conservation Union Regional Office for Southern Africa, Harare.

<sup>22</sup> Das, S., 2007, Mangroves - A Natural Defense against Cyclones: An investigation from Orissa, India. Policy Brief No 24-07, South Asia Network for Development and Environmental Economics, Kathmandu.

<sup>23</sup> Burke, L. and J. Maidens, 2004, Reefs At Risk in the Caribbean. World Resources Institute, Washington DC.

<sup>24</sup> Emerton, L., 1999, La Diversité Biologique de Djibouti: Analyse Economique, Bureau Nationale de la Diversité Biologique, Direction de l'Environnement, Ministère de l'Environnement, du Tourisme et de l'Artisanat, Government of Djibouti.

# How governments are under-investing in nature conservation

The studies show clearly the immense importance of nature to human and economic wellbeing. Yet, more worryingly, they also underline a common problem: the funding available for protected areas is in almost all cases too little to enable them to be managed effectively, and for nature to be conserved.

The studies find that the quantity of financial resources allocated to protected areas tends to be outweighed massively by the economic benefits they generate at local, national and global levels. Less than 0.05% of the total budget is for instance allocated to Venezuela's National Parks, despite the fact that just the value of the carbon storage provided is however more than ten times as high as the public funding they receive each year. Protected area funding also tends to compare extremely badly with public investments made in other sectors of the economy. In Mexico, the annual budget for protected areas is equivalent to just 0.6% of expenditures being made under the National Infrastructure programme, and is only just 0.2% of the subsidies and other transfers made in support of rural development by the Ministry of Agriculture, Cattle, Rural Development, Fisheries and Food. The bottom line is that there is

simply not enough funding to enable protected areas to function effectively. In Indonesia, for example, protected area funding is believed to be only half the amount that is required.

The findings of the studies are backed up by global and regional-level data, which confirm the low level and declining trends in protected areas financing. In Latin American and Caribbean countries, investment in the environment during the 1990s averaged less than 1% of GDP<sup>25</sup>. In Vietnam, government funding to centrally-managed PAs has been maintained at around 0.5% of total public budget allocations over the past decade<sup>26</sup>. Even the United States, where US\$2.5 billion was allocated by the federal government to the National Parks Service in the fiscal year ending 2004, this amounted to just 0.1 percent of the total federal budget for the year<sup>27</sup>. One recent estimate of the total value of global development assistance to public protected areas in the developing world estimates that the current funding of between US\$350 million and 420 million a year is only about half that which was being provided in the early 1990s<sup>28</sup>.



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<sup>25</sup> Barcena et al. (2002) cited in Castro, Gonzalo. 2003. Conservation Finance: The Long Road to Sustainability. Presentation to the Sustainable Finance Stream, Vth IUCN World Parks Congress, 8-17 September 2003: Durban, South Africa.

<sup>26</sup> Emerton, L., Rao, K., Nguyen, N., Tu, N., and Bao, T. 2003. Covering the costs of Vietnam's Protected Areas. IUCN - The World Conservation Union and Government of Vietnam Forest Protection Division: Hanoi.

<sup>27</sup> National Park Service: [http://data2.itc.nps.gov/budget2/documents/ten\\_year\\_budget\\_history.pdf](http://data2.itc.nps.gov/budget2/documents/ten_year_budget_history.pdf); US Federal Government: <http://www.gpoaccess.gov/usbudget/fy04/pdf/budget/tables.pdf>

<sup>28</sup> Khare (2003), cited in Molnar et al. (2004) op cit.

# Sustaining Protected Area values: *what policymakers and funders can do*



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A key question then arises: what can (and should) policymakers and funders do to ensure that the value of nature and protected areas for human and economic wellbeing is sustained?

The studies show that investing in nature conservation through protected areas support economic growth and human livelihoods. In contrast, continuing to undervalue these important natural assets will adversely impact the economy and will consequently increase poverty. If governments and the international community are really serious about improving human and economic wellbeing, then it is imperative that they allocate sufficient funds to conserving nature and protected areas. This includes:

- At the international level, to abide by the obligations that are embodied in international agreements to fund protected areas and biodiversity conservation, in their own right (for example the Convention on Biological Diversity 2010 Target and Programme of Work on Protected Areas) or as part of efforts to support sustainable development and alleviate poverty (for example through the Millennium Development Goals).
- At the national level, to allocate sufficient budgets to protected areas and generate enabling policy and legal conditions that include participatory governance structures. This requires a greater commitment to increase and generate new sources of funding, harmonize the legal frameworks with competing and contradictory legislation, and establish improved participatory and inclusive protected area management schemes.
- At the local level, generate participatory management options that include sustainable resource access, generation of low impact economic activities and integration of distributional and equity concerns. Considering that in many cases, the people directly affected by the restriction imposed to access natural resources in protected areas, subsidize the provision of economic benefits to the broader society; it is important to consider compensation schemes and incentive mechanisms to benefit the local population. Protected areas should count with sufficient management and investment budgets that also include social and economic development projects.

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