

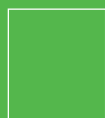
Sustaining the Environment to Fight Poverty and Achieve the MDGs

THE ECONOMIC CASE AND PRIORITIES FOR ACTION



A Message to the 2005 World Summit

Prepared on behalf of the Poverty-Environment Partnership by



WORLD
RESOURCES
INSTITUTE

Disclaimer

This publication is a joint product of staff from UNDP, UNEP, IIED, IUCN and WRI, prepared on behalf of the Poverty-Environment Partnership. The views expressed herein do not necessarily reflect those of their respective governing bodies, or when applicable, the countries there represented.

Other Poverty-Environment Partnership Publications

1. Linking Poverty Reduction and Environmental Management: Policy Challenges and Opportunities (2002)
2. Poverty and Climate Change: Reducing the Vulnerability of the Poor through Adaptation (2003)
3. Environmental Fiscal Reform for Poverty Reduction (2005)

Available at www.povertyenvironment.net/pep

Sustaining the Environment to Fight Poverty and Achieve the MDGs
The Economic Case and Priorities for Action

Designed by Paul Melia, Propagate Design LLC.
Printed by Bedwick & Jones Printing, Inc.

First printing September 2005
All rights reserved

United Nations Development Programme
One United Nations Plaza
New York, NY 10017

Foreword

An historic opportunity—the eradication of poverty—is within reach of the 2005 World Summit. However, a critical barrier persists: progress on eliminating poverty will only be possible with expanded, more effectively targeted investments in environmental management as a means of achieving the Millennium Development Goals (MDGs).

Speeding progress towards the MDGs will require stepping up attention to and investment in the environment. Investing in sound and equitable environmental management makes good economic sense, and a major scaling-up of worldwide investment in the environment is essential for creating the opportunities that people need to lift themselves out of poverty. Increased investment alone is not enough, however. To be effective, investment must be accompanied by the empowerment of communities, local governments and the private sector to lead local development efforts. Of particular importance is the need for governance and policy reforms that extend to poor people secure property and user rights over the environmental assets that provide their livelihoods, and that ensure a greater voice in decisions affecting how these assets are managed.

To inform deliberations at the Summit, the Poverty-Environment Partnership (PEP)—a network of more than 30 international development and environment agencies—launched the ‘Environment for the MDGs’ initiative to galvanize support for the significant scaling up of worldwide investment in environmental management to help win the fight against poverty and achieve the MDGs. The PEP commissioned two background reports—one on the economic case for investing in the environment to reduce poverty and the other on tools and methodologies for assessing environment’s contribution to poverty reduction and pro-poor growth. The following synthesis paper is intended to summarize the key messages contained in these reports and stimulate discussion and debate on a common agenda for action.

The 2005 World Summit provides a critical opportunity to mobilize a much wider ‘coalition’ of interested governments, inter-governmental organizations, research institutes, businesses and civil society organizations to take this agenda forward, as an essential component of global action to end poverty and secure the benefits of healthy ecosystems for all the Earth’s inhabitants, now and in generations to come.



WORLD
RESOURCES
INSTITUTE

About the Poverty-Environment Partnership

The Poverty-Environment Partnership (PEP) is a network of bilateral aid agencies, multilateral development banks, UN agencies and international NGOs that aims to address key poverty-environment issues within the framework of international efforts to achieve the Millennium Development Goals. Analytical work and knowledge-sharing activities undertaken by the PEP since 2001 points to three broad, fundamental lessons that underpin efforts to link poverty reduction and environmental management:

- The environmental quality of growth matters to people living in poverty;
- Environmental management cannot be treated separately from other development concerns;
- People living in poverty must be seen as part of the solution rather than part of the problem.

PEP Member Organizations: Bilateral Agencies: Belgium, Canada, Denmark, Finland, France, Germany, Ireland, Japan, Netherlands, Norway, Sweden, Switzerland, United Kingdom, United States. Multilateral/UN Agencies: African Development Bank, Asian Development Bank, European Commission, UN Food and Agriculture Organization, Inter-American Development Bank, International Fund for Agricultural Development, International Monetary Fund, Organization for Economic Cooperation and Development, UN Department for Economic and Social Affairs, UN Development Programme, UN Environment Programme, The World Bank, World Health Organization. International NGOs: International Institute for Environment and Development, IUCN-The World Conservation Union, World Resources Institute, WWF International.

More information on the PEP can be found at www.povertyenvironment.net/pep.

Acknowledgements

The Steering Committee for the PEP 'Environment for the MDGs' initiative includes UNDP (Peter Hazlewood and Charles McNeill), UNEP (Esther Reilink and David Smith), DFID (Helen O'Connor), IIED (Steve Bass and Tom Bigg), IUCN (Joshua Bishop and Andrew Deutz), SEI (Johan Rockström), WRI (Dan Tunstall) and WWF (Dawn Montanye and David Reed). UNDP and UNEP co-chair the Steering Committee. IIED coordinated the analytical work underpinning this synthesis report and prepared the initial draft. The supporting paper on the economic case for investing in the environment to reduce poverty and support pro-poor growth was led by IUCN (with principal author David Pearce), and a second paper on tools and methodologies for assessing environment's contribution to poverty reduction and pro-poor growth was led by WRI. The synthesis report also draws on a brief survey of opinion-formers in over thirty countries led by LEAD International.

The Steering Committee is grateful to many PEP members, as well as the Ring network of policy institutions, for contributing valuable insights and information. Special thanks go to Karen Holmes, who edited the synthesis paper, and to Paul Melia, who guided publication design and production.

Overview

The world's poor depend critically on fertile soil, clean water and healthy ecosystems for their livelihoods and well-being. This reliance creates complex, dynamic interactions between environmental conditions, people's access to and control over environmental resources, and poverty. Understanding the nature of these relationships is a prerequisite for enduring success in the fight against poverty. Yet, the central importance of environment for poverty reduction, and the economic case for pro-poor investment in environmental assets, remains dishearteningly unfamiliar to many. As a result, the environmental concerns of the poor all too often are marginalized within the context of national development planning and efforts to reach the MDGs.

To improve understanding of the complex relationships between poverty reduction and environmental sustainability, the Poverty-Environment Partnership (PEP)—a network of international development and environment agencies—has sponsored analytical work and consultations, the results of which are presented in the following paper. In this paper, we lay out the case for the economic importance of environment for poverty reduction and pro-poor growth, and also set out some key strategic options and priorities for scaled-up investment in environmental sustainability for helping to reach the MDGs.

The first section of the paper summarizes evidence demonstrating the dependence of the poor on natural resources to earn their livelihoods, the vulnerability of the poor to environmental hazards, and the barriers faced by the poor in deriving full benefits from their environmental assets. Highlighted in the second section are the results from rigorous economic research on the returns to investments in the productivity of environmental assets, including solid evidence that such investments can generate large benefits for the poor and for enhancing overall growth in developing economies. Finally, we outline several areas for strategic action and response at multiple scales—from local to sub-national, national and multilateral—to encourage the investments needed for major, lasting reductions in poverty.

Sustaining the Environment to Fight Poverty — Key Messages

- Greatly expanded public and private investment in the productivity of environmental assets can generate strong returns for poverty reduction, and is needed to create opportunities for people to lift themselves out of poverty.
- Strong local institutions are key to improving environmental management for poverty reduction, and should be a strategic focus of capacity development efforts.
- Integrated approaches are needed to put pro-poor investments in the productivity of environmental assets at the heart of national development and poverty reduction strategies and sectoral planning at the national, sub-national and local levels.
- Pro-poor changes in environmental governance—such as strengthening of property and resource rights to communally held land—will be needed to empower the poor and enable them to invest in, and reap the benefits of, improved management of environmental assets.
- Innovative market-based instruments can provide a mechanism for encouraging pro-poor investments in environmental management and the provision of environmental services, such as water and sanitation, especially in partnership with the private sector.
- Strengthening the information base for decision-making—particularly with respect to the use of geo-referenced information tools—is crucial to attracting expanded, pro-poor investment in environmental assets and to help guide pro-poor policy development and implementation.
- Benchmarking donor support to the above in terms of aid volumes, as well as innovations and changes in donor policy and practice, is needed in order to enhance development cooperation effectiveness and partnerships.

Unleashing the Wealth of the Poor: Environmental Opportunities for People to Escape Poverty

Environmental sustainability is the foundation on which strategies for achieving all the other MDGs must be built, because environmental degradation is causally linked to problems of poverty, hunger, gender inequality and health.

UN Millennium Project, 2005

The loss of services derived from ecosystems is a significant barrier to the achievement of the MDGs.

Millennium Ecosystem Assessment, 2005

Poor households rely heavily on environmental assets as a source of wealth from which to generate income and improve their livelihoods.

The health and well-being of all humans depends on clean water, clean air, fertile soils and other services provided by natural systems (see Box 1). However, environmental assets and the services they provide are especially important for people living in poverty. A majority of poor people in rural areas draw much of their livelihoods from forests, pastures, fisheries or farming. The importance of so-called *environmental income* from forest ecosystems is particularly well-documented: studies show that nearly 1.1 billion people worldwide depend on forests for their livelihoods,¹ and that forest-related income provides a significant share of total household income in many global regions, with dependence on forests highest in Latin America, where this source makes up 35 percent of total income.² Other ecosystems provide similarly important benefits; for example, coral reefs are a source of substantial income for poor households from fishing.³ A study in Cambodia

found that fuelwood, fishing and other resources provided by mangroves contributed 20 to 58 percent of household incomes, with heavier reliance among poorer households.

Box 1: Ecosystem services are vital for human well-being

Ecosystem services are the key to 'environmental income', the most direct way that nature affects the poor. The Millennium Ecosystem Assessment — an unprecedented four-year study conducted by more than 1,300 scientists from 95 countries — demonstrates that humans depend fundamentally on ecosystems and the flow of services they provide, including:

- *Provisioning services* — food, fresh water, fuelwood, fiber, bio-chemicals and genetic resources;
- *Regulating services* — water, climate and disease regulation and water purification;
- *Cultural services* — recreation and ecotourism, educational and spiritual;
- *Supporting services* — bio-geophysical systems of soil formation, nutrient cycling and primary biological production that underpin the other services.

Many ecosystem services do not flow directly through markets or lack a market price that reflects their full economic value. As a result, the fundamental importance of these ecosystem services often is not recognized until they are degraded or lost.

Table 1. Some estimates of the composition of per capita wealth, 2000 (2000\$)

Income group (excluding oil states)	Man-made, or 'produced' wealth	Environmental or 'natural' wealth	Residual or 'intangible' wealth	Overall wealth per capita	Environmental wealth as % of total wealth
Low income	1,174	1,925	4,433	7,532	26
Middle income	5,347	3,496	18,773	27,616	13
High income OECD	76,193	9,531	353,339	439,063	2
World	16,850	4,011	74,998	95,860	4

Source: K. Hamilton, G. Ruta, A. Markandya, S. Pedroso, P. Silva, M. Ordoubadi, G-M Lange, L. Tajibaeva, L. Gronnet and M. Dyoulgerov, *Where is the Wealth of Nations? Measuring Capital for the 21st Century* (Washington, DC: World Bank, 2005, forthcoming).

One compelling source for evidence of the poor's reliance on environmental assets is participatory poverty assessments (PPAs), which seek to understand poverty through the eyes of poor people themselves. A review of 23 PPAs revealed that environment was in all cases considered a crucial component of well-being, especially where environmental resources were low-quality, damaged or withdrawn.⁵ The poor, particularly women and the poorest members of the community, cited poor governance—that is, weak rights and the lack of government services and accountability—as important constraints to better environmental management

Environmental assets also are an essential source of wealth for developing-country economies.

Environmental assets make up a far larger share of national wealth in developing countries than in high-income countries. A World Bank study estimates that environmental wealth accounts for 26 percent of the total wealth of low-income countries, versus 13 percent of wealth in middle-income countries and only 2 percent of wealth in OECD countries⁶ (table 1). Because the nature of the assets held by the poor determines the strategies they can use to lift themselves out of poverty, the large share of natural resources in the wealth of developing countries, *and* in the asset base of poor households, argues for a strong role for

environment in reducing poverty, fighting hunger and disease and improving well-being

The environmental assets of poor households are under severe and increasing stress, reducing their livelihood opportunities and ability to escape poverty.

Successful, sustainable poverty reduction requires expanding the asset base of the poor and increasing the efficiency with which these assets can generate income and well-being. However, the environmental assets that make up a disproportionately large share of the wealth of the poor are vulnerable to rapid depreciation, even more so than other kinds of assets, unless cared for and regenerated. With few assets, low-quality assets and lack of access to technology to make their assets more productive, poor households and communities may have incomes that are too low to generate re-investable surpluses for maintaining, much less expanding, their asset base. Insecure property and resource rights and other disincentives to wise management and use of resources also contribute to degradation of environmental assets.

The results of severe and increasing stresses on environmental assets are all too apparent in many parts of the world. The Millennium Ecosystem Assessment found that most (15 of 24) of the essential services provided by ecosystems—ranging from food production to water quality and availability, disease

Table 2. Excess mortality due to indoor air pollution

Region	Excess risk: under-5 mortality		Adult female deaths as % of under 5 deaths
	Urban %	Rural %	%
China	15	35	40
E.Asia/Pacific	15	35	15
Market economies	0	0	0
Former socialist	7.5	17.5	15
India	15	35	15
L.America/Caribbean	7.5	17.5	15
Middle East	7.5	17.5	15
S.Asia	15	35	15
Sub-Saharan Africa	7.5	17.5	15

Source: G. Hughes, 'Comparing the Costs of Local Air Pollution with the Effects of Global Climate Change' (Paper presented to UN Economic Commission for Europe Conference on Economics and Epidemiology, London, 2002).

management and climate regulation—are being used unsustainably and the capacity for continued delivery of these services is being persistently eroded.⁷ Most environmental degradation is driven by the overconsumption of the rich, and evidence from poverty mapping studies confirms that the poor tend to reside in areas with stressed and/or low-quality environmental resources, such as land of naturally low soil fertility, polluted air, contaminated water and water shortages. Degradation of fragile, marginal lands has escalated to the extent that the livelihoods of 250 million people and the prospects for eliminating hunger have been directly harmed, while a further 1 billion people are now at risk. By 2050, one quarter of the world's population will live in countries affected by chronic water shortage.

Strategies to reduce poverty must also address another important dimension of the poverty-environment nexus: the greater vulnerability of the poor to environmental hazards, including natural hazards, such as storms, floods and droughts, as well as man-made threats, such as air and water pollution (table 2). This vulnerability has been revealed by numerous participatory poverty assessments, and recent work in mapping poverty.⁸ For instance, the poor often live on marginal lands, such as steeply sloped areas, where they are at higher risk of landslides and resulting loss of life during storms and floods. Poor people also suffer greater loss of life and health from pollution and other environment-related causes. Developed by the World

Health Organization, an indicator that adjusts life expectancies based on the burden of disease shows that, on average, 20 percent of the total loss of life expectancy in developing countries is attributable to environmental causes, versus only 4 percent in rich countries. Globally, lack of safe water and sanitation is the predominant environmental cause of loss of life expectancy, but poor air quality also is a major contributor. Women and children are particularly vulnerable to illness and death caused by indoor air pollution, which accounts for a greater share of lost life expectancy in developing countries than malaria, but receives little attention.⁹

The poor face barriers that exclude them from access to high-quality environmental assets and hamper their capacity for sound environmental management.

Arguably even more important for poverty reduction than expanding the asset base of the poor is improving the *context* for wealth creation by the poor. Among the critical factors that determine this context is 'environmental governance', especially the nature and strength of property and resource rights that affect poor people's ability to control their assets, as well as the rights of the poor to information and participation in public decisions that affect environmental resources. Often, the poor have little political clout and only weak rights over land and other environmental assets, making them vulnerable to displacement by more

powerful groups in society, as for instance, when forest dwellers are displaced by illegal loggers and wildlife poachers, or when the urban poor are displaced by property developers as land values rise on the outskirts of cities. Weak property rights also limit the capacity of the poor to obtain credit and invest in improvement of their land and other environmental assets.

Subsidies and other economic policies may create incentives that end up working against the capacity of the poor to manage their environmental assets. For example, artificially low water prices can harm rather than help small-scale farmers, because the failure to recover operating costs typically leads to the decline and failure of irrigation systems.

Just as governance and policy tend to favor the rich and powerful within developing countries, global governance systems tend to reflect the interests of richer, more powerful countries. OECD government spending on subsidies in the agriculture, energy and water sectors damage developing economies and outstrips the development assistance provided by these governments by a factor of 10. The developed countries have erected trade barriers that limit international markets for many commodities in which developing economies, given their endowments of environmental wealth and their abundant labor, have strong comparative advantages. Multilateral environmental agreements (MEAs), the dominant instruments of international environmental governance, have little or no real power to influence international trade and investment regimes and often lack adequate funding to support equitable participation by developing countries.

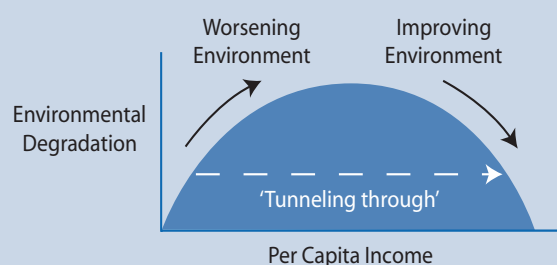
Investing in Environmental Management:

Strong Returns for Poverty Reduction and Improving the Livelihoods of the Poor

The investment needs of the poor are diverse, and decision-makers must weigh the need for pro-poor investments in environmental assets against investment needs in other sectors, including education, health and infrastructure. For many years, economic orthodoxy held that, in making such tradeoffs, environmental quality was a luxury that could be sacrificed in the short term in order to secure greater economic gains in the long term. Economists have since demonstrated that this interpretation of historical development experience is both invalid and dangerous for the world's poor. Environmental degradation is neither the inevitable price of, nor a desirable path for, economic development. Indeed, evidence suggests that pursuing a development path that accepts environmental degradation as the price of progress can lead to situations in which the benefits of

rising incomes are largely offset—or even outweighed entirely—by economic losses from damages to ecosystems and their ability to provide key services, such as clean air and clean water, that support human health and well-being.¹⁰

The 'Environmental Kuznets Curve'



The EKC posits a relationship between levels of environmental degradation and per capita income. Recent analysis shows that the EKC hypothesis fails to describe experience with many forms of environmental change. Clear instances include biodiversity loss and global climate change, which entail irreversible losses that no amount of income growth can restore. The EKC also has limited relevance for key issues such as the management of environmentally marginal lands occupied by the poor in developing countries, which if degraded, can quickly become 'desertified', that is, approaching zero soil productivity.

Finally, the evidence suggests that, even where the EKC broadly fits experience, it is highly sensitive to policy measures that enable a 'tunneling through' by which societies can bypass an early period of accelerating environmental decline and move directly onto a development trajectory that traces a path of environmental improvement. In short, the EKC is neither inevitable, nor does it describe a desirable development path.

Source: D.W. Pearce, *Investing in Environmental Wealth for Poverty Reduction* (Report prepared for the Poverty-Environment Partnership, 2005, forthcoming).

Box 2. Environmental improvement is consistent with economic growth: Debunking the 'Environmental Kuznets Curve'

Some have argued, incorrectly, that environmental quality must decline, or should be traded off, in order for the poor to improve their lot. This argument—that environmental degradation is a 'necessary evil' for achieving the MDGs—is based on the 'environmental Kuznets curve' (EKC) hypothesis, which suggests that environmental assets are degraded in the early stages of economic development, only to improve after some income threshold has been passed. This misreading of historical development experience often underlies an implicit assumption in the development community that the environment is a 'luxury good', something the developing world can buy into when it is richer. Such a view is intellectually unfounded and can bias development efforts against the environment and the poor.

Nevertheless, the perception remains that scarce development finance should not be allocated towards environmental investments because, worthy though such investments may be, they secure a lower rate of return than investments in other forms of capital. Until fairly recently, it has been difficult, for technical reasons, for economists to measure rates of return on environmental investments and so test the assumptions that underlie this argument.¹¹ However, modern economic research on the complex interrelationships between poverty and the environment has now shown that the returns to environmental investments are multifaceted, and environmental economists have taken huge strides in demonstrating the benefits of such investments in money terms. A few key results of this research are highlighted below.

It is important to bear in mind that in most instances, the ability of the poor to invest in and benefit from improvements to their environmental assets—for example, through soil conservation or protection of natural ecosystems—depends on their having clear rights to the resource in question, especially through locally defined, enforceable controls on resource access. Thus, for the examples highlighted below, the returns to investment are predicated on, and in fact may be highest for, the transfer of rights over resources away from state ownership and centralized control, and toward decentralized, participatory systems that support community-based organizations and local rights.

Investments in increasing access to *water supply and sanitation* yield very high rates of return, with benefit-to-cost ratios in range 4:1 to 14:1, making them extremely attractive from a social investment standpoint.

Improved water supplies and sanitation create time savings (that is, time not spent traveling long distances to fetch water) that translate into higher economic output and productivity as well as greater school attendance. Cost savings from reduced incidence of waterborne diseases also are a significant source of benefits. Because of economies of scale, achieving

comprehensive water and sanitation targets often generates higher returns than less ambitious targets. For instance, one study found that a benefit-cost ratio of 14:1 for providing the entire population with access to safe water and sanitation, *plus* chlorine treatment and safe water storage, while the benefit-cost ratio for reaching the MDG7 target (that is, halving the population without access to safe water and sanitation) was 7.5:1¹² (table 3).

Rates of return to investments in *soil conservation* measures can be very high, with substantial variation according to geographic context and the specific conservation technology used.

An economic survey of soil conservation in Central America and the Caribbean found mixed results, with high rates of return (60 to 85 percent) for various conservation measures (such as terraces, rock walls and diversion ditches) on diverse crops (corn, sorghum, coco yam) in diverse settings (Costa Rica, Haiti, Honduras, etc.).¹³ Evidence from other global regions is not as well-documented, but partial surveys suggest a similar picture. Moreover, such studies often understate the benefits of soil conservation because they take into account only the impacts on crop productivity and do not incorporate other significant benefits of slowing land degradation, including improved food security, increased school attendance (due to decreased demand for child labor), enhanced creditworthiness and access to finance for farmers (based on better land quality), protection of vulnerable habitats for maintaining biodiversity, and reduced contribution to global warming.

Increasing access to *sustainable energy services* is likely to yield high returns on investment, while benefiting the poor and the environment.

Although the MDGs contain no explicit target for energy supply or energy 'quality' for the poor, it is difficult to imagine major progress in eradicating

Table 3. WHO estimates of water and sanitation investment costs and benefits (\$US billion/year)

Goal	Cost	Benefits	Benefit/Cost ratio
Halving the population with access to suitable water and sanitation: The Millennium Development Goal target	11.3	84.4	7.5
All population with access to suitable water and sanitation	22.6	262.9	11.6
All population plus water treatment with chlorine and safe storage	24.6	344.1	14.0
All population plus in-house piped water plus in-house sewerage and partial treatment	136.5	555.9	4.1

Source: G. Hutton and L. Haller, *Evaluation of the Costs and Benefits of Water and Sanitation Improvements at the Global Level* (Geneva: World Health Organisation, 2004). Online at www.who.int/water_sanitation_health/en/wsh0404.pdf

Note: Investment costs are annualized over 20-40 years depending on the nature of the investment.

poverty without significantly expanding the quantity and quality of energy services consumed by the poor. The International Energy Agency estimates that investments of about \$17 billion per year over 12 years will be needed to provide an additional 500 million people with access to electricity by 2015, consistent with MDG 1 of halving extreme poverty.¹⁴ Further investment on the order of \$11 billion per year is needed to replace the traditional biomass fuels (wood, dung, charcoal) used by the poor for cooking and heating with cleaner, modern fuels, such as kerosene.¹⁵ Surprisingly, economic studies have not estimated in money terms the benefits of these investments. However, benefits of \$40-56 per person per year would be sufficient to just offset costs.¹⁶ Since this figure represents less than 10 percent of average rural expenditure for energy and only 2-3 percent of average urban expenditures,¹⁷ investments in access to sustainable energy are likely to have significantly positive benefit-cost ratios.

Moreover, replacing the traditional biomass fuels used by the poor would yield multiple benefits in terms of time savings (for women and children who currently spend hours per day collecting fuel), improved human health (due to better indoor air quality), reduced environmental damage from fuelwood cutting, and improved soil quality (from returning animal dung

to farmers' fields rather than burning it). Besides fuel switching, improved household stove technology is another important means to reduce health-damaging indoor air pollution from cooking and heating. Available studies suggest very high returns on investment in terms of benefits to women's and children's health, with benefit-cost ratios ranging from 47 to 118 in Kenya, for instance.¹⁸

Investments in *protecting and restoring natural ecosystems* can produce substantial net benefits, especially for the poor.

Investments in conservation can help protect intact ecosystems from conversion to less diverse uses, such as agriculture. When carefully designed and managed, conservation pays and the poor gain, too. Agroforestry, a conservation option that incorporates trees and enhanced wildlife habitat into cropland, produces high returns on investment, with benefit-cost ratios ranging from 1.7 to 6.1.¹⁹ Economic studies of wetlands and mangroves consistently show that conservation is economically attractive, with benefit-cost ratios in the range of 1.2 to 7.4.²⁰ Investments in wildlife conservation can also help the poor when the benefits of conservation, largely in the form of tourism revenues, are shared equitably with local communities.

Experience in southern Africa has shown that wildlife conservation can be more profitable than alternative land uses, such as cattle ranching²¹ (table 4).

Another key aspect of natural systems is ecological resilience, that is, the cushioning provided by genetic and species diversity that buffers ecosystems against stresses and shocks, and promotes their continued ability to provide the environmental services needed to support human life and livelihoods. Some experts believe that the main consequence of biodiversity loss for poor communities lies in the loss of ecological resilience and correspondingly higher risks of ecosystem collapse. Further study of the economics of resilience is a high priority in order to develop reliable estimates of the value of this resilience and the benefits of investments that help maintain it.²²

Investments in *climate change adaptation* are critically needed to help poor, vulnerable populations cope with the effects of environmental change.

Available studies of economic damages from global climate change consistently show that, relative to their income levels, the poor will lose far more than the rich.²³ Large numbers of poor people in developing countries are engaged in climate-vulnerable agriculture that is expected to become less productive as human-induced warming proceeds. Moreover, many of these vulnerable rural communities inhabit low-lying areas (of islands and river deltas) at risk of climate-related flooding, and most have limited capacity to adapt to changing climate. Without action to mitigate or adapt

Table 4. Rates of return to wildlife conservation ventures

Country and venture	Rate of return or benefit-cost ratio	Comments
Namibia Farm-scale mixed wildlife/livestock	3.9 to 5.8%	Financial internal rate of return: various studies. Low returns.
Game viewing	4.2%	Financial rate of return
Conservancies	8 to 19% 22 to 131% 23 to 230%	High economic rate of return Rate of return to communities
Botswana Tourist lodge	27.5%	Very attractive return
Ostrich farming	11.0%	
Crocodile farming	19.0%	
Safari hunting	38.0%	Very high return
Game harvesting/trophies	28.0%	
Comparator investment - cattle	2.0%	Many wildlife ventures more profitable than cattle
Zimbabwe Wildlife ranch	21.5%	Many wildlife ventures more profitable than cattle
Comparator investment - cattle	13.1%	
Kenya Community wildlife sanctuaries	0.8 to 1.5 (B/C)	Some economic values transferred from other studies
State-managed national parks	0.6 to 8.9 (B/C)	

Source: D.W. Pearce, *Investing in Environmental Wealth for Poverty Reduction* (Report prepared for the Poverty-Environment Partnership, 2005, forthcoming)

to climate change, an additional 2.0 to 2.6 billion people will be at risk of malaria and an additional 2.1 to 3.0 billion people could face water shortages by the 2050s.²⁴

The magnitude of economic damages from climate change depends on the level of successful adaptation to climate-induced changes in agricultural productivity. One study estimates losses in 2050 that range from 11 percent (no adaptation at all) to 2 percent (maximum adaptation) of GDP in Africa and from 6 percent to 0.4

percent of GDP in Asia.²⁵ A key aspect of adaptation to environmental change is reducing vulnerability to natural disasters—including storms, floods, fires and crop failures—which experts predict will increase in frequency and severity because of climate change. With 97 percent of all deaths from natural disasters occurring in developing countries, investments in disaster prevention are a high priority, saving on average \$7 in recovery costs for every \$1 spent on prevention.²⁶

Meeting the Scaling-Up Challenge: Strategic Action to Support National and Local Responses

Strong leadership will be needed to stimulate the scale and types of investments needed to produce major, lasting reductions in poverty. Outlined below are several areas for strategic action and responses to enable developing economies to realize the pro-poor benefits of better environmental management.

Integration of environmental assets into MDG-based poverty reduction strategies and other national and local development plans, including context-specific targets and indicators.

The Millennium Development Goals, as a framework for national development planning, provide an unprecedented opportunity to focus attention on poverty reduction and to mobilize private investment and development assistance to help countries develop and implement effective poverty reduction strategies. To seize this opportunity, countries must create development plans ambitious enough to reach all the MDGs, including MDG 7 on environmental sustainability.

Identifying priority environmental assets and associated investments can help contribute to integrated responses addressing the linked challenges of poverty, hunger, disease, gender inequality, and environmental degradation. Because natural resources are typically the principal assets of developing countries, effective management of a portfolio of these assets is a must if a developing country is to grow economically and meet the MDG targets for reducing poverty and improving the well-being of its people. Development planning processes should support an integrated operational approach to linking poverty reduction and investment in the productivity of the environmental assets of the poor. Key principles that should guide such processes are well-known, including:

- Incorporation of environmental dimensions early in the planning process to uncover investment opportunities
- Participation by stakeholders representing the poor and environmental interests as well as government and business to facilitate negotiation and the formation of partnerships

- Emphasis on ‘rewiring institutions’ to better coordinate government policy and actions across sectors produces greater efficacy as well as efficiency..

A governance and policy framework that works for poverty reduction and environmental sustainability.

For effective pro-poor policies and investments, governance matters. This is particularly so when it comes to the environmental assets of the poor. Governance conditions must enable poor people to access, develop, manage and benefit from those environmental assets that are key to their livelihoods, health and security. Major elements of a pro-poor environmental governance regime include: secure property and resource rights, decentralized management, strong institutions of communal property, effective anti-corruption measures, and a ‘voice’ for the poor through access to information, participation and justice.

Better governance produces a better policy environment and enabling conditions that favor pro-poor asset formation and protection. For instance, in Nepal and India, conferring strengthened resource rights over local forests to communities spurred the formation of some 20,000 forest user groups to protect and manage those resources. Moreover, as studies have consistently shown, better governance is strongly associated with higher rates of income growth.

- *Local-level Institutions* Effective local governance is central to improving environmental management and reduce poverty, as well as to their successful integration. Of particular importance are local-level institutions that are accessible to poor people and adapted to the complex set of resource rights that have evolved over time in a specific location. The range of these resource rights can be quite broad, encompassing not just outright land ownership but also rights to resources but not the land, rights to some resources but not others, time-of-year access rights, restrictions on sales or

other assignment of rights to outside parties and so forth. Mechanisms are needed to help local institutions adjust to rapid change, including the natural growth of population as well as inward migration by outsiders.

- *National-level Efforts* At the national level, governance and policy must support poor people’s local efforts to manage, regulate access to, and improve the quality of environmental assets, and to determine how the resulting output will be shared. For instance, national governmental action to recognize traditional customary law concerning communally held resources, perhaps including the titling of such resources, might be required to provide the security needed to attract investments in soil and water conservation or to provide collateral for credit

Instruments that encourage investment in the pro-poor productivity of environmental assets.

Most investments in the productivity of environmental assets to generate benefits for the poor have strong ‘public good’ characteristics, which means that private interests alone are unlikely to produce an optimal level of such investments. Consequently, government needs to invest directly and/or introduce incentives to encourage commercial investors and non-profit organizations to invest. Economic policy instruments can play a catalytic role. Many of these instruments are relatively new, and there is a corresponding need for research, pilot programs and learning facilities to expand related experience and understanding.

- *Environmental Fiscal Reform:* A range of taxation and pricing measures can support environmental goals that contribute directly to poverty reduction, for example, by reducing the overuse of scarce, inefficiently priced resources, such as water. The revenues raised by such measures can be used for direct support of, or to free up public finance for, other pro-poor investments.

- *Credit and Insurance Schemes:* Well-designed schemes, notably for micro-credit, enable poor households to bear the risks associated with investing in environmental assets and to develop sustainable enterprises based on these assets.
- *Payments For Ecosystem Services:* Market-based instruments to capture the financial value of ecosystem services can be an important tool for improving livelihoods and attracting capital to poor communities in developing countries. Such instruments provide a mechanism for communities in the global South to market and sell a new 'commodity', that is, environmental services that create valuable benefits for people and businesses elsewhere. Emerging markets in ecosystem services can be structured in ways that enable small- and medium-sized enterprises to participate profitably through projects that create multiple benefits—for example, a community-based tree planting project that generates income and livelihoods for the poor while providing water filtration services that prevent sediments from damaging a downstream power plant. However, in most instances policy action will be required to lower transaction costs and remove other barriers to enable community ecosystem-service providers to compete effectively.

Capacities, methodologies and tools for monitoring and assessing environment's contribution to poverty reduction.

In most developing countries, there is an urgent need for assistance in addressing technical, budgetary and institutional constraints to rigorous, comprehensive environmental monitoring and assessment to gauge the contribution of environmental assets to wealth creation and pro-poor growth.

- *Country-specific targets for the pro-poor productivity of environmental assets.* One key area for support to developing countries is in country-led processes to establish country- and context-specific priorities for reaching MDG 7 on ensuring environmental

sustainability. Much greater support is needed for developing-country processes aimed at setting nationally relevant targets for increasing the pro-poor productivity of environmental assets. Such targets can play an important role in ensuring that sufficient attention is paid to protecting and restoring the capacity of ecosystems to provide vital services for human well-being, especially services relied on heavily by the poor for their livelihoods. Country-specific targets and performance indicators are particularly needed to monitor and assess ecosystem status with respect to environmental regulation services that do not flow through markets, and whose value and loss often are not accounted for as these services are over-consumed and the capacity of ecosystems to provide them is diminished.

- *Strengthening the information base.* Another critical area for assistance to developing countries is in strengthening the information base for planning, decision-making and assessments related to the pro-poor productivity of environmental assets. Such information, especially core data sets to support decision-making, is crucial to attracting expanded investments in environmental assets capable of generating significant benefits for the poor. For example, every country should have a high-resolution map of where the poor are located so that pro-poor policies and investments can be targeted to the right localities. These maps can be integrated with ecosystem service maps to assess the environmental assets available to the poor to help them move out of poverty. Such information is essential to establish and support legal and regulatory regimes that can provide secure property and resource rights to enable the poor to establish and enforce effective controls on users and uses of key environmental assets.
- *Capacity development for environmental assessment tools.* Various analytical tools are available to help developing countries integrate environmental, economic and social dimensions into decision-making on development options. Building developing-country capacity to use

these tools for integrated assessment of pro-poor investment in environmental assets is a high priority. For example, strategic environmental assessment (SEA) offers a systematic process to analyze the environmental (and, increasingly, the social) effects of policies, plans and programs and mainstream environmental considerations into strategic processes at the earliest stages. Regarded as the 'frontier' of SEA, sustainability appraisal is an assessment methodology that aims to expand the scope of assessment beyond predictions of impact and instead address the very foundations of decision processes, such as the formulation of problems and objectives, and to evaluate the tradeoffs between the environmental, social and economic dimensions of sustainability.

- *Advances in wealth accounting.* Methodologies for measuring the asset base of nations, and more so of poor households, are in their infancy. World Bank research on wealth accounting is building up a picture of the composition of the wealth of nations, including the contribution made by environmental wealth and the relative importance of different kinds of environmental assets (timber, cropland, minerals and so forth). Findings from wealth accounting studies promise to provide important insights into for the development process, including 'rules of thumb' for determining whether the development trajectory of a given country is being achieved through running down of its assets versus development based on increases in wealth, as well as guidance for countries on how to invest revenues from environmental assets so that these proceeds are used to expand wealth rather than just financing current consumption. More research is needed to further understand the services provided by environmental assets, the damage being done to them and their role in wealth creation. As the methodologies of wealth accounting continue to develop, wealth accounts need to be extended at household level to shed greater light on households' direct and indirect use of environmental assets.

Box 3. Poverty mapping to improve planning and decision-making

An increasingly important instrument for analyzing the dimensions of human deprivation is poverty mapping, which combines high-resolution maps of the geographic areas in which poor people reside, overlaid with maps providing a spatial representation of factors linked to the incidence of human poverty. Poverty mapping techniques can be powerful tools for identifying areas where development is lagging, and what kinds of investment could have the greatest impact on well-being. For instance, a poverty mapping study of Cambodia revealed that the areas where the poor reside are characterized by low access to water and highly fragile soils. Poverty maps have also revealed areas of poverty coinciding with high levels of biodiversity, indicating a potential for increased well-being from natural wealth. One key implication of the results from poverty mapping studies is that measures to reduce poverty will usually need to be tailored to environmental conditions and assets at a given location, with limited scope for more generalized, 'broad-brush' policy approaches to provide cost-effective remedies

Increased resource mobilization, notably through development cooperation and the private sector.

Cost estimates for achieving the MDGs make clear the need for *major increases in development assistance*, and indeed, for a doubling of aid as called for by the United Nations Millennium Project. Given the importance of environmental assets for poor people's efforts to lift themselves out of poverty, as well as the central role of environmental wealth in many developing economies, it seems prudent for developing countries to devote a

significant proportion of this increased aid to further understanding the linkages between environmental resources and poverty reduction and to integrating this knowledge at an operational level in planning, policies, and programs.

Also needed are continued improvements in *aid effectiveness*. As donors develop action plans to implement the environmental principles within the Paris Declaration on Aid Effectiveness, they should consider how aid can be made more effective in supporting pro-poor investment in the productivity of environmental assets. Options for action along these lines include:

- Improving aid procedures to enable long-term investments in pro-poor management of environmental assets;
- Supporting implementation of multilateral environmental agreements in ways that benefit poor people in developing countries;
- Mechanisms to improve donor coordination on funding of and reporting requirements for aid to support environmental management;
- Full and effective replenishment of the Global Environment Facility (GEF) to direct investment in environmental assets that can benefit the poor of developing countries as well as producing global environmental benefits, and support for procedures to enable equitable participation of developing countries in GEF planning and projects.

Much of the needed investment and innovation in deploying environmental assets for poverty reduction will necessarily come from the *private sector*. The key capability of the private sector is in operationalizing activities that create value. As identified by the World Economic Forum, four key areas for private-sector opportunities to advance the MDGs are: core business activities, public-private partnerships or hybrid business models, philanthropy and engagement in governance and public policy processes. All of these are relevant

for addressing poverty-environment linkages, with a view to long-term, sustainable wealth creation and regeneration of environmental resources. Especially needed is private-sector involvement in creating frameworks and markets that enable the provision of credit and insurance to the poor for their efforts to enhance the productivity of their environmental assets.

Effective coalitions and partnerships.

Many different kinds of organizations, from development aid agencies to environmental groups and private business, have been exploring issues related to the linkages between poverty and environment. Thus, a broad group of multilateral, governmental, civil society, academic and business actors appears to be emerging in support of action to establish environmental concerns in their rightful place, that is, at the very heart of efforts to achieve all the MDGs.

A global coalition linking North and South, rich and poor, could bring powerful influence to bear on these issues. Possible activities for the partners in such a coalition to work together to advance include:

- Strengthening developing-country capacities to integrate environment and poverty reduction in governance regimes, especially with respect to documenting and reinforcing the resource rights of the poor;
- Collaborating on the development of in-country capacity for environmental information methodologies and systems, including poverty mapping and the development of ecosystem service accounts;
- Developing advisory and support services for environmental investments;
- Strengthening the capacity of local institutions to work effectively in pro-poor management of environmental assets;

- Ensuring that intergovernmental agreements on climate change, biodiversity conservation and other environmental issues are equitable and effective for poor people and low-income countries.

Endnotes

¹ UN Millennium Project, *Investing in Development: A Practical Plan to Achieve the Millennium Development Goals, Overview* (New York: United Nations, 2005).

² See P. Vedeld, A. Angelsen, E. Sjaasrad and G. Berg, *Counting on the Environment: Forest Income and the Rural Poor*, Environmental Economics Series No. 98 (Washington, DC: World Bank, 2004), which reviewed 54 separate studies in developing countries. The global average contribution of forests to household income was \$678, or 22 percent.

³ See H. Cesar, 'Coral reefs: their functions, threats and economic value', in *Collected Essays on the Economics of Coral Reefs*, ed. H. Cesar (Kalmar, Sweden: Kalmar University, 2000), and IMM Ltd., *Reef Livelihoods Assessment Project: Global Overview of Reef Dependent Livelihoods and the Poor* (London: DFID, 2002).

⁴ See C. Bann, 'Economic analysis of alternative mangrove management strategies in Cambodia', in *Valuing the Environment in Developing Countries: Case Studies*, eds. D.W. Pearce, C. Pearce and C. Palmer (Cheltenham, England: Edward Elgar, 2002), pp. 501-535, and IUCN, *Cambodia: Rapid Participatory Assessment for Wetland Valuation, Veun Sean Village, Stoeng Treng RAMSAR site*, Case Studies in Wetland Valuation No. 11 (Gland, Switzerland: IUCN, 2005).

⁵ DFID, *Poverty and the Environment: What the Poor Say*, Environment Department Issues Paper No. 1 (London: DFID, 2001).

⁶ K. Hamilton, G. Ruta, A. Markandya, S. Pedroso, P. Silva, M. Ordoubadi, G-M Lange, L. Tajibaeva, L. Gronnevet and M. Dyoulgerov, *Where is the Wealth of Nations? Measuring Capital for the 21st Century* (Washington, DC: World Bank, 2005 (draft)).

⁷ Millennium Ecosystem Assessment, *Millennium Ecosystem Assessment-Synthesis Report* (Washington, DC: World Resources Institute, 2005).

⁸ S. Bass, H. Reid, D. Satterthwaite, and P. Steele, *Reducing Poverty and Sustaining the Environment: The Politics of Local Engagement* (London: Earthscan, 2005).

⁹ D.W. Pearce, *Investing in Environmental Wealth for Poverty Reduction* (Report prepared for the Poverty-Environment Partnership, 2005, forthcoming).

¹⁰ L. Gangadharan and R. Valenzuela, 'Interrelationships between income, health and the environment: extending the environmental Kuznets curve hypothesis', *Ecological Economics* 36 (2001): 513-31.

¹¹ For a technical discussion of the issues surrounding computation of rates of return on environmental investments, including choice of social discount rates, see D.W. Pearce, *Investing in Environmental Wealth for Poverty Reduction* (Report prepared for the Poverty-Environment Partnership, 2005, forthcoming).

¹² See G. Hutton and L. Haller, *Evaluation of the Costs and Benefits of Water and Sanitation Improvements at the Global Level* (Geneva: World Health Organisation, 2004). Investment costs are annualized over 20 to 40 years, depending on the nature of the investment. Online at www.who.int/water_sanitation_health/en/wsh0404.pdf

¹³ E. Lutz, S. Pagiola and C. Reiche, 'The costs and benefits of soil conservation: the farmer's viewpoint', *World Bank Research Observer* 9 (Vol 2, 1994), pp. 273-295.

¹⁴ See International Energy Agency, *World Energy Outlook 2004* (Paris: IEA, 2004). Estimates are for extending access to electricity to an additional 500 million people, over and above those expected to have electricity with ongoing programmes.

¹⁵ D.W. Pearce, *Investing in Environmental Wealth for Poverty Reduction* (Report prepared for the Poverty-Environment Partnership, 2005, forthcoming).

¹⁶ Based on an aggregate cost of \$28 billion per year and a coverage of 500-700 million people.

¹⁷ Energy Sector Management Assistance Programme, *Household Energy Use in Developing Countries: A Multi-country Study* (Washington DC: World Bank, 2003).

¹⁸ B. Larson and S. Rosen, 'Household Benefits of Indoor Air Pollution Control in Developing Countries' (Paper presented to USAID/WHO Global Technical Consultation on the Health Impacts of Indoor Air Pollution and Household Energy in Developing Countries, 2000, Washington, DC).

¹⁹ D. Anderson, *The Economics of Afforestation: A Case Study in Africa* (Baltimore, Maryland: Johns Hopkins University Press, 1987).

²⁰ D.W. Pearce, *Investing in Environmental Wealth for Poverty Reduction* (Report prepared for the Poverty-Environment Partnership, 2005, forthcoming), Table 6.11.

²¹ See J. Barnes, 'The economic returns to wildlife management in Southern Africa', in *Valuing the Environment in Developing Countries: Case Studies*, eds. D.W. Pearce, C. Pearce and C. Palmer (Cheltenham, England: Edward Elgar, 2002), pp. 274-288, and D.W. Pearce, 'The economics of African wildlife utilization', in *Economics and Environment: Essays in Ecological Economics and Sustainable Development*, ed. D.W. Pearce (Cheltenham, England: Edward Elgar, 1999), pp. 210-230.

²² D.W. Pearce, *Investing in Environmental Wealth for Poverty Reduction* (Report prepared for the Poverty-Environment Partnership, 2005, forthcoming).

²³ D.W. Pearce, *Investing in Environmental Wealth for Poverty Reduction* (Report prepared for the Poverty-Environment Partnership, 2005, forthcoming).

²⁴ M. Parry et al., 'Millions at risk: defining critical climate change threats and targets', *Global Environmental Change* 11 (2001):181-3.

²⁵ P. Winters, R. Murgai, E. Sadoulet, A. de Janvery and G. Frisvold, 'Economic and welfare impacts of climate change on developing countries', *Environmental and Resource Economics* 12 (1998): 1-24.

²⁶ J. Abramovitz, *Unnatural Disasters*, Worldwatch Paper 158 (Washington DC: Worldwatch Institute, 2001).



United Nations Development Programme
Bureau for Development Policy
Energy and Environment Group
304 East 45th Street, 9th Floor
New York, NY 10017
www.undp.org/pei



United Nations Environment Programme
Division of Policy Development and Law
Poverty and Environment Unit
PO Box 30552
Nairobi, Kenya
www.unep.org/dpdl/poverty_environment

Funding support provided by:

Government of Denmark
Government of Sweden and Göteborg University
SNV Netherlands Development Organization
United Nations Development Programme
United Nations Environment Programme
WWF International