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Journalist Guide to World Resources 2005

This guide is designed as a quick and helpful reference to the book for journalists. Also, please see the index to the book.

CHAPTER 1 – NATURE, POWER AND POVERTY

Also includes:

Box 1.1 The Dimensions of Poverty

Box 1.2 Life on a Dollar a Day

Box 1.3 Health, Environment, and Poverty

Box 1.4 Poverty and Governance in a Global Frame

Ecosystems are – or can be – the wealth of the poor. For many of the 1.1 billion people living in severe poverty, nature is a daily lifeline – an asset for those with few other material means. This is especially true for the rural poor, who comprise three-quarters of all poor households worldwide.

Harvests from forests, fisheries, and farm fields are a primary source of rural income, and a fall-back when other sources of employment falter. But programs to reduce poverty often fail to account for the important link between environment and the livelihoods of the rural poor. As a consequence, the full potential of ecosystems as a wealth-creating asset for the poor – not just a survival mechanism – has yet to be effectively tapped.

The thesis of *World Resources 2005* is that income from ecosystems – what we call **environmental income** – can act as a fundamental stepping stone in the economic empowerment of the rural poor. This requires that the poor manage ecosystems so that they support stable productivity over time. Productive ecosystems are the basis of a sustainable income stream from nature.

But for the poor to tap that income, they must be able to reap the benefits of their good stewardship. Unfortunately, the poor are rarely in such a position of power over natural resources. An array of governance failures typically intervene: lack of legal ownership and access to ecosystems, political marginalization, and exclusion from the decisions that affect how these ecosystems are managed. Without addressing these failures, there is little chance of using the economic potential of ecosystems to reduce rural poverty.

Making governance more friendly to the poor means tackling issues of property rights, access to information and decision-making, adequate representation, institutional transparency, and fairness in sharing the costs and benefits of resource management. These are all aspects of *democratic governance* – decision-making that respects the rights and needs of those who depend on resources. For the poor, democratic governance is the door to equity and one of the building blocks of sustainability.

This fusion of ecosystem management and good governance is also necessary to achieve the Millennium Development Goals, the set of eight goals adopted by the international community in 2000 to address world poverty. As the foundation of rural livelihoods, ecosystems are central to real progress toward the health, nutrition, sanitation, and environmental targets embedded in the Millennium Development Goals. Indeed, without empowering the poor to responsibly manage their environment for economic gain, we cannot effectively attend to rural poverty in its many dimensions.

The goal of this report is to highlight the vital role of ecosystems and their governance – of nature and power – in poverty reduction. The report's central question is: Who controls ecosystems, and how can this control be reconfigured to allow the poor to use their natural assets as sustainable sources of wealth creation, vehicles of political empowerment, and avenues of integration into the national and global economies?

Ecosystem management, democratic governance, and poverty reduction are each essential elements of sustainable economic growth. Moreover, these elements are inextricably linked. More than 1.3 billion people depend on fisheries, forests, and agriculture for employment – close to half of all jobs worldwide. This dependence of livelihoods on natural systems is nowhere more important than among the rural poor. In *Africa*, more than seven in ten poor people live in rural regions, with most engaged in resource-dependent activities, such as small-scale farming, livestock production, fishing, hunting, artisanal mining, and logging. This small-scale production accounts for a significant percentage of the GDP of many African nations.

Making wise choices about the use of natural resources and the distribution of environmental benefits and costs is central to maximizing the contribution that a nation's resource endowment makes to social and economic development. Many of the poorest regions of the world are, however, also the least democratic. That means much of their resource wealth is typically diverted from the public good through corruption, mismanagement, and political patronage. It is no coincidence that fundamental democratic principles such as transparency, public participation, accountability, and the separation of legislative, judicial, and executive powers are often absent in developing countries where poverty is greatest.

Many people in developing countries are thus not only poor, they are voiceless. Dependent directly on natural resources, they have little say in how those resources are used, but suffer the consequences when the decisions are corrupt and the use is destructive. For example, rural peoples' livelihoods are often in direct conflict with

extractive industries like large-scale fishing, logging, or mining, but they have little say in resolving that conflict. Access to decision-makers – government bureaucrats, lawmakers, or the courts – is typically for the powerful, not the poor.

Rectifying this imbalance means supporting democratic practices. History shows, however, that efforts to promote democratic principles in a vacuum rarely succeed. To take root, they must engage citizens, and they must deliver on matters that are immediate and important to citizens. As the source of livelihoods, the environment is arguably the most important issue that democracy must deliver on in the developing world. Put differently, the environment is not only a powerful tool for promoting democratic reform, but good environmental governance is fundamental to strengthening and consolidating democracy. Democratic institutions, in turn, are an important factor supporting strong economic growth.

This emphasis on good governance and environment is particularly relevant when addressing poverty. The case studies in this report and the experiences of an increasing number of villages and communities in many nations suggest that efforts to promote sustainable livelihoods among the poor are more successful when they simultaneously promote ecosystem stewardship and democratic governance. For that reason, a number of development agencies and nongovernmental organizations (NGOs) are beginning to focus on this integration of environment and governance.

In spite of increasing interest in this integration, its application to the alleviation of poverty is still new. Success will demand a new openness to go beyond traditional economic development strategies, or at least to add a more deliberate recognition of the linkages between nature, power, and poverty.

Despite the improving poverty rates of such success stories as *China* and *Vietnam*, **poverty is very much present in the world today**. In fact, in many countries, poverty continues to worsen. Between 1981 and 2001, the number of people living on less than \$1 per day in *Sub-Saharan Africa* rose from 2 percent in 1981 to 20 percent in 2001, largely as a result of the collapse of communism in those regions. The scourge of AIDS adds to the problem, particularly in Africa, where the disease is wiping out many of the gains against poverty made over the last few decades. Even in China, the incidence of poverty increased during the late 1990s as the nation's torrid pace of economic growth slowed for a few years. In the *United States*, the number of poor has risen steadily since 2000, reaching almost 36 million people in 2003—some 1.3 million more than in 2002.

The environment is also a source of **vulnerability**. Environmental factors contribute substantially to the burden of **ill-health** the poor suffer. In addition, low-income families are especially vulnerable to **natural disasters** and environment-related risks such as the growing impacts of global **climate change**. As these environment-poverty links have become clear, major development institutions and donors have begun to make the environment a more central feature of their efforts to tackle poverty.

Nature has always been a route to wealth, at least for a few. Profit from harvesting

timber and fish stocks, from converting grasslands to farm fields, and from exploiting oil, gas, and mineral reserves has created personal fortunes, inspired stock markets, and powered the growth trajectories of nations for centuries. But this scale of natural resource wealth has been amassed mostly through unsustainable means, and the benefits have largely accrued to the powerful. It is the powerful who generally control resource access through land ownership or concessions for logging, fishing, or mining on state lands; who command the capital to make investments; and who can negotiate the government regulatory regimes that direct the use of natural resources. The poor, by contrast, have reaped precious little of the total wealth extracted from nature. But that can change.

Maximizing environmental income for the poor requires **changes in the governance of natural resources**. The need for such changes is pressing because the poor are at a great disadvantage when it comes to controlling natural resources or the decisions surrounding them. They often lack legal ownership or **tenure** over land and resources, which restricts their access and makes their homes and livelihoods insecure. They also suffer from a lack of voice in decision-making processes, cutting them out of the decision-making loop. Natural-resource **corruption** falls harder on the poor as well, who may be the victims of bribe-demanding bureaucrats or illegal logging and fishing facilitated by corrupt officials who look the other way. The poor are also subject to a variety of policies—such as taxes and various regulations – that are effectively anti-poor.

These governance burdens make it hard for poor families to plan effectively, to make investments that might allow them to profit from their assets or skills, or to work together effectively to manage common areas or create markets for their products. In other words, governance burdens quickly translate to economic obstacles.

The environment provides a powerful tool to promote **democratic reform**. Civil society in general has used the environment to great effect to push the process of democratization in regimes where civil liberties had been restricted. During the turn towards democracy in *Chile* and *East Asia* in the 1980s, and *Eastern Europe* in the 1990s, protests led by environment-focused civil society groups played an important role. For example, WAHLI, a prominent *Indonesian* environmental group, was one of the few NGOs tolerated by the Suharto government in the 1980s.

More than ever, national governments, international institutions, and donors are focused on poverty reduction. But their efforts have often given limited attention to the role of healthy ecosystems in providing sustainable livelihoods, and equally limited attention to the importance of environmental governance in empowering the poor. The models of economic growth that nations continue to rely on for poverty reduction – job creation through increased industrialization, intensified large-scale agriculture, industrial fishing fleets, and so on – do not fully appreciate the realities of rural livelihoods.

For example, these strategies miss the fundamental fact that if ecosystems decline through poor governance, the assets of the poor decline with them. Findings from the recently concluded **Millennium Ecosystem Assessment** – a five-year effort to survey the condition of global ecosystems – confirm that the burden of environmental decline

already falls heaviest on the poor. This often results in an immediate drop in living standards – a descent into greater poverty. This in turn precipitates migration from rural areas to urban slums or a resort to unsustainable environmental practices – overfishing, deforestation, or depletion of soil nutrients – for bare survival’s sake. For this reason alone – simply to prevent an *increase* in poverty – greater attention to ecosystem management and governance practices that serve the poor is vital. The promise that environment can be one of the engines of rural growth is all the more reason to keep environment as a focal point in poverty reduction efforts.

Completing this **transition from vulnerability to wealth** will require much more. It will demand local institutions that are accessible to the poor and empowered to manage local ecosystems; secure tenure that gives the poor a legal stake in good resource management; and viable models to commercialize nature-based products and services, including access to credit, transportation, and marketing savvy. And it will demand scientific guidance and technical help to optimize ecosystem management at low cost, and to ensure that local uses of nature do not threaten ecosystems at larger geographical scales and are consistent with national environmental goals. Facilitating this must be pro-poor political change that increases the accountability of government officials and service providers to the poor, and recognizes the potential role of the poor in national economic growth.

TABLE 1.1 ECOSYSTEMS BRING JOBS**Percent of Global Workforce Employed in Agriculture, Fisheries, and Forestry, 2001**

Region/Country	Percent of Active Workforce
WORLD	44
DEVELOPED COUNTRIES	7
DEVELOPING COUNTRIES	54
ASIA AND PACIFIC	60
Cambodia	70
China	67
India	59
Nepal	93
LATIN AMERICA AND THE CARIBBEAN	19
Bolivia	44
Guatemala	45
Haiti	62
NEAR EAST AND NORTH AFRICA	33
Afghanistan	67
Turkey	45
Yemen	50
SUB-SAHARAN AFRICA	62
Burkina Faso	92
Ethiopia	82
Niger	88
Tanzania	80
COUNTRIES IN TRANSITION	15
Albania	48
Azerbaijan	26
Tajikistan	33

Source: FAO 2004:169-174, Table A4

\$1 AND \$2 PER DAY POVERTY TRENDS, 1981-2001

	NUMBER OF PEOPLE (MILLIONS)						REGIONAL POPULATION 2001 (MILLIONS)
	LIVING ON \$1 PER DAY			LIVING ON \$2 PER DAY			
	1981	2001	Change since 1981	1981	2001	Change since 1981	
East Asia and Pacific	796	271	-66%	1,170	864	-26%	1,823
Eastern Europe and Central Asia	3	18	468%	20	94	363%	474
Latin America and the Caribbean	36	50	40%	99	128	30%	518
Middle East and North Africa	9	7	-22%	52	70	35%	300
South Asia	475	431	-9%	821	1,064	30%	1,378
Sub-Saharan Africa	164	316	93%	288	516	79%	673
Global Total	1,482	1,093	-26%	2,450	2,736	12%	6,127

Sources: Chen and Ravallion 2004.

A family of four interviewed in rural Bangladesh calculated that they spent roughly 80 cents a day on food and fuel, allowing them to buy and cook two meals of rice and beans, as well as an occasional piece of meat. Medical costs came to 3.3 cents a day (\$12 per year), mainly on medicines for the husband's coughs and colds. Other family expenses included 4.1 cents per day on clothes (\$15 per year), 1.6 cents on school books (\$6 per year), and 2.2 cents (\$8 per year) visiting and giving presents to relatives. Family health and food costs thus accounted for more than 90 percent of the household's basic expenses (Rutherford 2002:10).

CHAPTER 2 – ECOSYSTEMS AND THE LIVELIHOODS OF THE POOR

Also includes:

Box 2.1 Findings of the Millennium Ecosystem Assessment: How do the Poor Fare?

Box 2.2 Brazil Nuts and Palm Hearts: Bringing Forest Livelihoods to the City

Ecosystems provide the foundation for all human survival, since they produce the food, air, soil, and other material supports for life. Everyone, rich and poor, urban and rural, depends on the goods and services that ecosystems provide.

But the rural poor have a unique and special relationship with ecosystems that revolves around the importance of these natural systems to rural livelihoods. By *livelihoods*, we mean the whole complex of factors that allow families to sustain themselves materially, emotionally, spiritually, and socially. Central to this is *income*, whether in the form of cash, or in the form of natural products directly consumed for subsistence, such as fish, fuel, or building materials.

As this chapter will show, the rural poor derive a significant fraction of their total income from ecosystem goods and services. We refer to such nature-based income as environmental income. Because of their dependence on environmental income, the poor are especially vulnerable to ecosystem degradation.

Environmental income – the income generated from ecosystem goods and services—is a major constituent of the household incomes of the rural poor. It includes income from natural systems such as forests, grasslands, lakes, and marine waters. It also includes agricultural income—the output of agroecosystems.

Researchers often make a distinction between agricultural income and what in this report we term “wild income” – that is, income from less manipulated natural systems like forests and fisheries. This distinction means that these two income streams are often counted and analyzed separately. Wild income deserves special attention, since it is often the element that is not accurately accounted for in most considerations of rural livelihoods. But both agricultural and wild income are important to an accurate assessment of the dependence of the poor on ecosystems for income. In addition, there is overlap between the two, as in the use of forest grasses for livestock forage, or forest leaf litter as a soil amendment or crop mulch.

TABLE 2.1 NUMBER OF PEOPLE DEPENDENT ON ECOSYSTEMS

Dependent on forests in some way	1.6 billion
■ Smallholder farmers who grow farm trees or manage remnant forests for subsistence and income	500 million to 1 billion
■ Indigenous people wholly dependent on forests	\$60 million
Poor dependent on agriculture in Sub-Saharan Africa	>500 million
Rural poor who keep livestock	600 million
■ Landless rural poor who keep livestock	150 million
Fishers and fish-farmers in the Lower Mekong River basin	40 million

Source: Angelsen and Wunder 2003; IFAD et al. 2004; Kara et al. 2004; Haggblade et al. 2004

Ecosystems have several characteristics that make them attractive as a source of income. Environmental resources are renewable, widespread, and they are often found in common property areas where the poor can access them without owning the land. In addition, exploiting natural systems often can be done with little need for investment or expensive equipment, making the cost of entry low – an important consideration for poor families with limited assets.

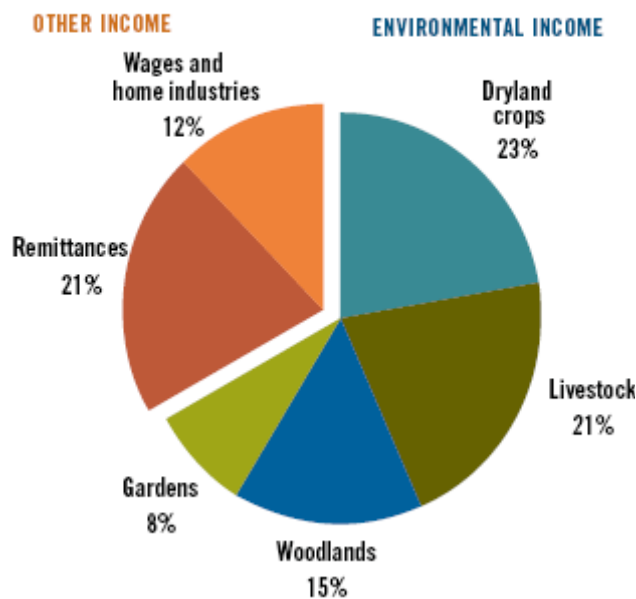
TABLE 2.2 DIVERSE USES OF ENVIRONMENTAL INCOME

Location	Ecosystem	Goods or Services Used	Benefit to Households
Shindi Ward, Southern Zimbabwe	Forests and grasslands	Wild fruits, timber, thatching grass, livestock fodder	Ecosystems contribute an average of 35% of total income. Cavendish 2000
Southern Malawi	Forest	Firewood, fruit, mushrooms, bushmeat, insects, honey	Forest income contributes up to 30% of total income. Fisher 2004
Gulf of Mannar, India	Reefs	Seaweed, shellfish, sea cucumber, medicines, lobster	Reefs are often the only source of cash income for poor families, providing up to \$199 of income annually. Whittingham et al. 2003
Coquimbo Region, Chile	Semi-Arid	Pasture, fodder	80–90% of poor households use common pool resources. Bahamondes 2003
Iquitos, Peru	Tropical forest	Non-timber forest products, including fruits, latexes, medicines, tourism and carbon sequestration	Forests provide \$422 of potential sustainable income per hectare annually. Lampietti and Dixon 1995
Budongo Forest, Uganda	Semi-deciduous tropical forest	Fuel wood, building materials, wood for furniture, food, medicinal plants	Biomass provides 90% of the energy needs for the country and between 6% and 25% of household income in Bundongo village. Aryal 2002
Bushbuckridge District, South Africa	Agriculture	All crops including maize, cassava, morogo, various fruits	Total value of wild and crop plants was US\$269 per household per year. High and Shackleton 2000
Chimaliro Forest Reserve, Malawi	Agriculture	Maize, cassava, ground nuts, pulses, soy beans, potatoes	Food crops contributed between 45% and 55% of household income. Botha et al. 2004
Jhabua, Madhya Pradesh, India	Agriculture	Agriculture, fuelwood, timber, fodder for livestock	Environmental income (including agriculture and resource collection) was the largest household income source for the poorest 25%. Narain et al. 2005

Much of the environmental income earned in the developing world comes from **common pool resources (CPRs)**. Common pool resources are forests, fisheries, reefs, waterways, pastures, agricultural lands, and mineral resources that no individual has exclusive rights to. They are typically owned and administered by the state, a village, a tribe, or other social grouping, with the idea that the benefits will accrue to many people rather than one person or family. Local and distant residents go there to collect fire wood, graze their cattle, gather nontimber forest products like medicinal herbs or mushrooms, hunt, fish, collect water, or make use of a variety of other services such as visiting sacred groves. Because these “commons” or “public domain” lands are such a rich source of environmental income, they are a crucial element in the livelihood strategies of the poor, particularly those who do not own land themselves.

Just how important are they? Research over the past two decades has amassed a fair amount of evidence on this topic, particularly in *India*. N.S Jodha, in his pioneering study of 80 villages across seven semi-arid states in India, found that the poor make extensive use of common areas, with CPRs contributing 15-25 percent of household income. Other studies from different states in India have found that CPRs contribute up to 29 percent of the income of poorer households. Altogether, CPRs contribute some US\$5 billion a year to the incomes of India’s rural poor, according to one estimate.

FIGURE 2.2 HOUSEHOLD INCOME BY SOURCE, MASVINGO PROVINCE, ZIMBABWE



Source: Campbell et al. 2002

Without access to these resources, poor families would be virtually unable to support themselves. For example, poor households in Jodha’s study met 66-80 percent of their fuel requirements from CPRs. Common areas also contribute a great deal of fodder, allowing poorer families to raise more livestock than they would otherwise be able to support.

Environmental income is not only important to the poor. Richer families also make extensive use of income from ecosystem goods and services. (“Rich” here does not necessarily imply high income by developed-world standards, but a greater relative level of wealth and opportunity compared to lower income households within the same community.) In fact, several recent studies have shown that the rich commonly derive more environmental income, in absolute terms, than the poor do. This generally reflects the fact that they have greater ability to exploit what ecosystems can provide. For example, higher-income families may have more livestock and can therefore make better use of forage resources in common areas, whereas a poor family’s forage demand may be more limited due to their smaller herd size.

A study in the *Jhabua district in the Indian state of Madhya Pradesh* showed wealthier families using more fodder resources to feed their larger herds. In addition, the rich frequently have greater access to hired labor, transportation, credit, arable land, or other factors needed to maximize harvest of natural products or agriculture and bring them to market. In the Jhabua study, these factors allowed rich families to earn nearly five times as much environmental income – from a combination of farming, livestock rearing, and collection of wild products – as the poorest families.

On the other hand, even if the rich capture greater environmental income, they tend not to be as dependent on such income as are the poor. Environmental dependency and poverty seem to go hand in hand. A 1999 study of 12 *Himalayan villages* found that the poor relied on natural resources for 23 percent of their income, compared to only 4 percent for the rich. In *Botswana’s Chobe region*, the difference was even greater, with the poor depending on wild products from nearby common property lands for half their total income, while the rich depended far more on employment income and remittances, deriving less than 20 percent of their income from the nearby commons. (See *Figure 2.4*.) This was in spite of the fact that rich families in Chobe earned four times as much actual income as poor families from natural resources.

The poor and the rich also tend to use natural resources differently to derive income. The poor tend to pursue a variety of different sources of environmental income, while the rich often concentrate on one or two that allow them to make use of their greater assets for agriculture or livestock rearing. In the Chobe example, three-fourths of the income that the rich derive from the commons comes from livestock rearing, while the poor diversify their efforts, spending time in at least five different activities, from collecting wild foods to making baskets and carvings from natural materials. (See *Figure 2.5*.)

The continued dependence of the poor on ecosystems for their livelihoods stems from several factors, but these generally reduce to the fact that nature is their best – and often only – option. The poor often lack the education and social access to find consistent wage labor. Without wage income, households lack the cash to purchase fuel, food, and services like health care. To substitute, they use small-scale agriculture and other forms of nature-based income, often collected from common areas. When given options for other forms of employment, the poor often reduce their dependence on environmental income.

In any case, the clear implication of most detailed studies of environmental income is that increasing the productivity of ecosystems, and therefore the potential to derive more income, would benefit all income classes in rural areas, not just the poor. Both the poor and the rich stand to gain more income, and rural economies more stability, if ecosystems are managed for greater productivity.

By looking directly at **individual ecosystems** – such as agroecosystems, forests, fisheries and reefs – and the value that they provide to the poor, their importance to livelihoods becomes more obvious.

Deriving income from the environment is clearly a powerful tool for improving the lives and livelihoods of individual families, but it can also bring **significant societal benefits** by making the distribution of wealth in a community more equal. If environmental income is not counted, the income distribution in rural communities is often significantly skewed, with a large gap between rich and poor. However, if environmental income is included in the income profile, the gap between rich and poor shrinks somewhat. This supports the contention that ecosystem goods and services act as community assets, whose benefits reach beyond the individual household level. By providing an income source to those without other assets, ecosystems moderate and buffer the rural economy and increase economic equity. This provides another rationale for sound management of local ecosystems.

The use of natural resources and especially their degradation also has other implications for households and for communities. Rural communities are often bound together by shared professions based on nature – fisher, pastoralist, or farmer – or their use of a specific set of forest resources. In other words, natural resources are often a binding element of communities. Community-based resource management can increase this bond, fostering community cohesion and strengthening the social safety net for poor community members. Conversely, degradation of resources can harm communities and poor households by increasing the effort and time required to meet basic needs. Deforestation and scarce or polluted water supplies can increase the amount of time required to collect adequate fuelwood and water for daily use. Since women are usually charged with providing wood and water, longer collection times usually translate to less time to prepare food, care for young children, and help with agricultural activities. In low-income households, this can translate into poorer nutritional status and can harm the general household welfare.

Often, a portion of the collecting burden falls on the children in a household. Greater collection times can reduce the chances that children, especially girls, will remain in school. In *Malawi*, where more than 90 percent of households use firewood as their main source of energy, children in fuelwood-scarce districts are 10 to 15 percent less likely to attend secondary school. (See *Figure 2.6*.) A study in *Nepal* found that educational attainment of girls in poor households dropped as fodder and water availability decreased, suggesting that the additional labor fell to school-age girls in the household. On the other hand, restoration of traditional forest enclosures in the *Shinyanga region* of

Tanzania has dramatically increased forest cover in the district and reduced collection times for fuelwood by several hours per day, on average – a direct benefit to poor families. (See Chapter 5 case study, *Regenerating Woodlands in Tanzania: The HASHI Project.*)

These social and community benefits of nature point to how intact ecosystems can support many non-income aspects of rural livelihoods, adding weight to the argument that better ecosystem management is a crucial element of rural poverty reduction.

As this chapter demonstrates, environmental income is critical to the survival of the poor within the typical rural economy in developing countries. On average, income from small-scale agriculture and the collection of wild products such as nontimber forest products together account for some two-thirds of the household incomes of families in poverty. Without income from ecosystem goods and services, rural poverty would unquestionably be deeper and more widespread – a lesson to remember as the pace of ecosystem degradation picks up worldwide.

But as important as environmental income is to the poor today, it is typically not used as a route out of poverty. Usually, the poor use environmental income more as a support for current levels of consumption or as a safety net to keep from falling further into poverty. They generally do not have the means or empowerment to use environmental income as a tool for true wealth creation. As Chapter 3 will show, behind this failure to capitalize on the potential of ecosystems for income is an array of governance failures. The challenge is to alter this state of affairs, increasing the access of the poor to local ecosystem potential and their capacity for managing this potential sustainably and profitably, with viable models for turning nature's productivity into income.

CHAPTER 3 – THE ROLE OF GOVERNANCE

Also includes:

Box 3.1 Understanding the Scope of Resource Tenure

Box 3.2 How Community-Based Resource Management Can Benefit the Poor

Box 3.3 Empowering Communities Through Free, Prior, and Informed Consent

An abundance of natural resources does not necessarily translate into wealth for the poor. To make nature a source of prosperity for poor communities requires supportive governance conditions: policies and laws that protect the rights of the poor, coupled with responsive institutions that promote their interests. Without these, the presence of high-value resources like timber, gold, diamonds, or oil can actually be detrimental to poor communities, providing a target for exploitation by outside business interests and politicians. Too often, the result is that most of the revenues are appropriated by others, leaving the community—and local ecosystems—worse off than they were prior to “development.”

Even where high-value resources are not present, the patterns and institutions of governance are usually the critical factor determining how effectively the poor can harness ecosystems for their livelihoods. Where laws are biased against the poor and government practices disenfranchise them, the potential for better management of ecosystems to alleviate poverty is greatly diminished.

This chapter examines key governance conditions that influence whether nature becomes a source of wealth and prosperity for many, or merely a select few. It focuses on the three governance factors with the most concrete impacts on the poor and their capacity to derive environmental income: *resource tenure and property rights; decentralization of resource management; and the rights to participation, information, and justice.*

A person or community’s rights to land and other natural resources defines their natural resource tenure. Legally, **tenure** is a bundle of both rights and obligations: the rights to own, hold, manage, transfer, or exploit resources and land, but also the obligation not to use these in a way that harms others. In other words, tenure defines *property* and what a person or group can do with it – their **property rights**.

However, tenure is not only a legal concept but a complex social institution, often involving traditional practices and customary authorities as much as formal laws. It governs ownership and access to natural resources, which is the gateway to use and benefit from these resources. As such, tenure is at the heart of the poor’s ability to derive income and subsistence from ecosystems—to make them part of a sufficient and sustainable livelihood. (*See Box 3.1.*)

In many parts of the world today, resource tenure systems and property rights regimes are undergoing an important evolution. Fundamental shifts are occurring in the way that people and institutions think about the ownership of land, water, forests, fisheries, and

other natural assets—about who controls these assets, who benefits from them, and where the power to make decisions about them is vested.

Two countervailing global trends in the evolution of resource tenure are evident. One trend stems from globalization. The growing economic integration of nations and societies has increased the sphere of private property and private responsibility, with government assuming a lesser role with respect to the private sector and civil society. This has important implications for how public lands and natural resources—often common pool resources—are managed, with more power over resources transferred to corporate interests through privatization or the granting of resource concessions.

At the same time, there is a trend toward decentralization of natural resource management. Local and community-level institutions have become more assertive in the management of local resources, and this decentralized approach also has important implications for resource tenure. Indigenous groups have, for example, been more vigorous in pressing their ancestral claims to lands they inhabit but to which they lack formal title.

These two trends are shaping – and promise to profoundly transform – the capacity of the poor to earn environmental income from natural resources. For example, as illustrated in a study on the impact of globalization on the implementation of **community-based natural resources management (CBNRM)** in the *Philippines*, these global trends have the potential to both undermine and strengthen governance conditions that benefit the poor. Growing economic integration through increased trade and the emergence of multilateral environmental agreements, such those as on climate change and biodiversity, pose both threats and opportunities for poor communities worldwide.

The significance for the poor of changes in resource tenure systems and property rights systems is not limited to their economic impacts. For many rural communities, resource tenure is a central social institution that governs not only their relationship to the land and natural resources but also the relationships between families, between members of the community and those outside it, and between villages, communities, and peoples. Therefore, changes in tenure and property regimes have implications for the entire social fabric of rural communities. This is true for all tenure and property systems relevant to natural resources, but is particularly evident in the evolution of land tenure.

DESIGN PRINCIPLES FOR SUCCESSFUL COMMUNAL MANAGEMENT OF NATURAL RESOURCES

Why are some groups that use common pool resources able to prevent the “tragedy of the commons” while others are not? By examining thousands of case studies, researchers have identified the following conditions as crucial for successful community management of shared resources.

1. There is a clear definition of who has the right to use the resource and who does not, and clearly defined boundaries of the resource.
2. Users feel that their obligations for managing and maintaining the resource are fair in light of the benefits received.
3. Rules governing when and how the resource is used are adapted to local conditions.
4. Most individuals affected by the rules can participate in setting or changing them.
5. Use of the resource and compliance with rules is actively monitored by the users themselves or by parties accountable to the users.
6. People violating the rules are disciplined by the users or by parties accountable to them, with penalties imposed in accordance with the seriousness and context of the offense.
7. Local institutions are available to resolve conflicts quickly and at low cost.
8. Government authorities recognize users’ rights to devise their own management institutions and plans.

Adapted from Ostrom 1990:90

Across diverse economic and policy sectors, from health care and education to parks and wildlife management, decentralization is one of the most frequently pursued institutional reforms in developing countries today.

Decentralization is a process by which a central government transfers some of its powers or functions to a lower level of government or to a local leader or institution. In the natural-resource sector, an example of decentralization might be transferring from central to local government the responsibility for managing a tract of forest land, including the right to collect some of the income from sales of timber harvests in that forest. Or the central government might give a farmers group responsibility for managing an irrigation system, or grant a village council the right to manage wildlife and run a commercial tourism operation in a national park.

Decentralization is being driven by powerful economic, political, and technological forces. International development agencies such as the **World Bank** have placed decentralization in a prominent position on their agendas, and nongovernmental organizations (NGOs) and governments alike have promoted the concept, although often for different reasons. Advocates of decentralization cite the potential for greater efficiency, equity, and accountability when decision-making is brought “closer to the

people.” In theory, devolving power from central government means empowering local institutions that can better discern how to manage resources and deliver services to meet the needs of local people. Modern communication options like the Internet, television, and mobile phones help make local people and organizations more aware of their rights, more able to communicate and organize, and therefore more capable of asserting their rights.

But are central governments really so eager to give up some of the powers they have traditionally wielded? In the 1980s and early 1990s, decentralization emerged as a priority in an era of economic and budget crises. Shifting responsibility for health care, education, parks, and other planning and service functions to local governments offered opportunities to reduce central government budget deficits. Central governments are all too willing to pass on to local and community institutions the responsibility for managing resources and delivering services without providing them with necessary financial or technical support. They tend to be much more reluctant, however, to give up their powers to collect and allocate user fees, fines, or other revenues.

Areas with rich natural resource endowments tend to be geographically isolated and far from centers of political power where the most momentous development decisions are made. Furthermore, central governments are often run by and for elites, and people from poor rural communities or ethnic minority groups seldom occupy senior positions in the decision-making levels of bureaucracies. (*See Table 3.1.*)

The **democratic rights of the poor** and their capacity to participate in environmental decisions affecting their livelihoods are central to their ability to escape poverty. Yet despite their greater reliance on natural resources to earn their livelihoods, the poor have less say than their richer counterparts in how environmental decisions are made.

In much of the developing world the policies, practices, and institutions of political life serve to exclude a majority of citizens from full participation in public decision-making – especially the poor and socially marginalized. This is true even in many nations that are nominally democratic. Democratic governance is more than merely casting a ballot in periodic elections. It means having opportunities beyond the ballot box to make one’s voice heard, including participation in public hearings, review of official documents, and involvement in official processes, such as the preparation of environmental impact assessments. Full democratic engagement also means having opportunities not just to consult on projects already slated for implementation but also to play a role in shaping the design of public policies, in agenda setting and establishing priorities for public policy, and in monitoring ongoing projects to ensure that they produce the benefits originally anticipated. (*See Figure 3.3.*)

These principles of democratic empowerment in the arena of environmental decisions were articulated over a decade ago at the 1992 Earth Summit in Rio de Janeiro. Principle 10 of the Rio Declaration, adopted by 178 nations at the close of the Earth Summit, put forth a ground-breaking proposition: that every person should have access to information about the environment, opportunities to participate in decision-making processes

affecting the environment, and access to redress and remedy—that is, access to justice—to protect their rights to information and participation and to challenge decisions that do not take their interests into account. These three rights—the rights to information, participation, and redress—are often referred to as the *Access Principles*. (See Box 3.3.)

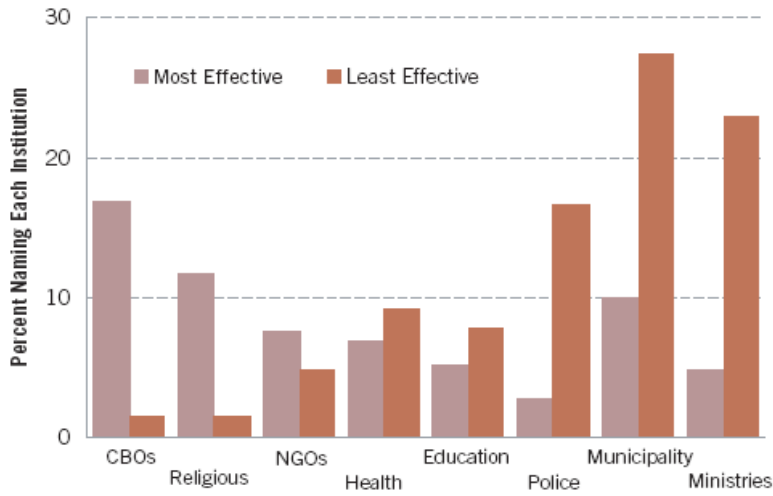
In 2002, during the World Summit on Sustainable Development, governments reaffirmed their commitment to Principle 10 and the Access Principles. At the same time, a coalition of governments, civil society organizations, and international institutions formed the Partnership for Principle 10 to help implement these principles at the national and local levels. Unfortunately, the record of most nations in conferring these basic rights is still far from perfect. A 2001 assessment of nine nations – both rich and poor – found a variety of systemic weaknesses. For example, many nations have improved their laws granting public access to government data and analysis, but implementation of these laws is weak. Information on water or air quality that average citizens can understand and use is often hard to find, and documents about the environmental effects of development projects are frequently not made available in a timely manner.

Even if information is made available, the public’s ability to participate in resource-related decisions such as timber harvesting or the siting of mines is still limited. Although the process of preparing and publicly airing environmental impact assessments has greatly increased in the last two decades, the public’s involvement still tends to be in the later stages, after many major decisions have already been made. And even when public comment is invited, many people do not have the capacity or time to take advantage of the opportunity. Performance on the Access Principles is weakest when it comes to access of ordinary citizens to redress. The ability of local people to appeal decisions they don’t agree with is often constrained by obstacles of cost, lack of clarity about procedures for appeal, and also the lack of “standing” as a legally recognized party with a legitimate interest in the case.

These access deficits are not restricted to the poor, but the poor tend to suffer them more acutely. Indeed, most of the world’s poor are excluded from interacting fully within the political processes of their country – and environmental decisions are decidedly political in many cases. They are held back by lack of education and literacy, by deficits of information and awareness, and by a lack of understanding of their rights and how to exercise them. Even where the poor are aware of their rights, other barriers may prevent them from becoming involved. People who are barely managing to eke out a subsistence livelihood often cannot afford the luxury of devoting time and resources to participation or even information-gathering. And they may be even less able to pursue a legal challenge to decisions with which they disagree, given the expense and time burden. (See Figure 3.4.)

FIGURE 3.4 THE POOR'S PERCEPTION OF RURAL INSTITUTIONS

Poll: Name the Most Effective and Least Effective Institutions in your Community



In discussion groups held worldwide, poor people were asked to name the five institutions they considered most and least effective. The bars to the left show the most frequently named institutions. Religious and community-based organizations (CBOs) were considered the most effective. Local governments and state ministries were considered the least effective.

Source: Narayan 2002

The remainder of this chapter details some of the ways in which the poor are particularly affected by deficits in their rights to information, participation, and justice. Also discussed are some of the successful steps that have been taken to address these shortcomings.

CHAPTER 4 – STEPS TO GREATER ENVIRONMENTAL INCOME

Also includes:

Box 4.1 Negotiating Indigenous Tenure Rights in Bolivia

Box 4.2 Fair Trade Certification: Rural Producers Meet the World

Box 4.3 Serving the Poor Profitably: A Private-Sector Approach to Poverty

Box 4.4 Paying the Poor for Environmental Stewardship

Box 4.5 Globalization, Governance, and Poverty

The wealth of nature in the form of environmental income is already a key component of rural livelihoods for both the rich and poor. But there is great potential for this component to grow, given the right conditions, and contribute to higher household incomes that lessen poverty. The first condition is an acceptance that better management of ecosystems can increase their productivity—immediately and over the long term. And, since the wealth of nature flows directly from the productivity of ecosystems, better management brings the potential for greater environmental income.

The second condition is that the access to and control of nature shifts so that the rural poor can both see the advantages of good ecosystem management and claim the benefits from it, overcoming the obstacles of disenfranchisement that have kept them economically and politically marginalized.

In this chapter we explore both these conditions – prudent management of ecosystems and governance that empowers the poor to profit from it. We consider the questions: What do we mean by better ecosystem management? What is its potential for poverty reduction? And what governance changes are required to route environmental income to the poor?

In addition, we examine the factors besides governance and eco-friendly practices that support the evolution of environmental income for poverty reduction. These revolve around the need to find successful models to commercialize ecosystem goods and services, coping with such constraints as marketing, transportation, and the need to capture greater value from nature-based enterprises than the poor often do. In addition, we consider the potential for “payment for environmental services” (payments for preserving the functions of ecosystems, such as water supply or carbon storage) to contribute to the portfolio of income-generating enterprises based on nature that the poor can tap.

In examining these factors, we put forth **four steps** to generate greater environmental income for the rural poor.

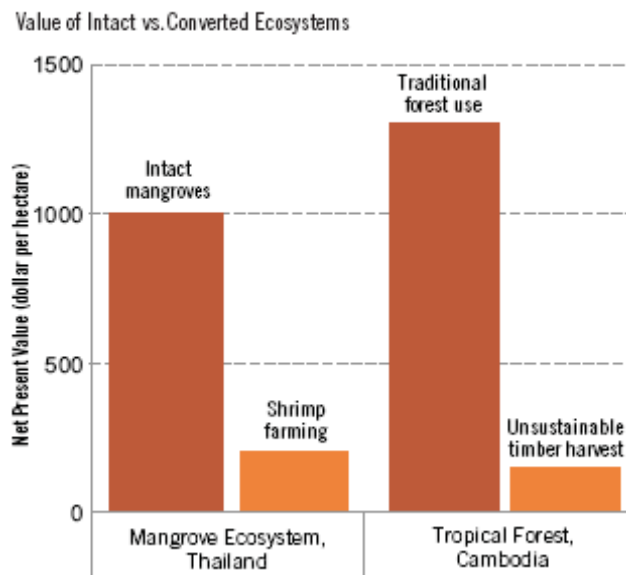
1. MORE INCOME THROUGH BETTER ECOSYSTEM MANAGEMENT

Healthy ecosystems work at peak productivity; degraded ecosystems produce less, particularly of the forest products, forage, clean water, crops, and bushmeat on which the poor tend to rely. In fact, degradation of ecosystem functions – in the form of nutrient-

depleted soils, overgrazed pastureland, logged-over and fragmented forests, and overfished lakes and coastal waters – has become a serious impediment to the livelihoods of the poor.

As the findings of the recently concluded Millennium Ecosystem Assessment show, ecosystem decline is widespread. The global drop in ecosystem health not only undermines the natural resource base that anchors a substantial fraction of the global economy but erodes the planet’s life-support systems more generally. The most immediate victims of this decline are the poor, whose household economies, as shown in Chapter 2, depend heavily on ecosystem goods and services. The pressures on ecosystems are particularly intense on many common property lands and fisheries—the most important source of environmental income for the rural poor. Examples are many and distributed on every continent and sea: denuded hills in western India; exhausted forests in *Madagascar* and *Haiti*; and depleted catches off *Indonesia*, *Jamaica*, or *Fiji* are just a few of the many instances where overuse and abuse of ecosystems directly impacts the poor.

FIGURE 4.1 MAINTAINING THE VALUE OF NATURE



Source: Millennium Ecosystem Assessment 2005b

2. GETTING THE GOVERNANCE RIGHT: EMPOWERING THE POOR TO PROFIT FROM NATURE

Addressing the need for greater tenure security so that the poor can tap ecosystems and invest in their good stewardship is a top priority. It requires reform of the formal tenure regimes that currently make it hard for the poor to exercise property rights over land and resources. Interest in **tenure reform** has grown significantly in recent years as acceptance of the central role of tenure security in poverty reduction has spread. When well thought-out and appropriately implemented, tenure reform can produce considerable benefits for the poor. The most important is an acknowledgement by the state that

traditional tenure arrangements, including communal tenure, are legitimate and legally enforceable.

Improving the tenure security of the poor and their ability to exercise property rights is only one step in the legal, economic, and political empowerment of poor families. A second important step is **devolving management authority** over ecosystems to local institutions that are more accessible to the poor.

As detailed in Chapter 3, decentralization that actually works for the poor is more the exception than the rule. It requires, at a minimum, that local institutions – whether they be official government institutions like village councils or informal institutions such as user groups, cooperatives, or watershed committees – are formed on democratic principles of representation, meaning that they are accountable to their low-income constituents. But this alone is not usually enough to overcome the structural bias against the poor in local institutions. Special efforts to include the poor are generally required. These can range from reserving gender-based or income-based slots in local institutions to insure participation; arranging for special outreach and training for members of these institutions; creating rules to insure equitable distribution of local benefits to low-income households; and using participatory rural appraisals and other survey techniques to help local institutions catalogue and quantify community needs and the potential trade-offs for any set of management actions. Of course, this is all predicated on the assumption that the state has granted these local institutions some actual authority over local resources – something that is still far from common.

FIGURE 4.2 EFFECTS OF WATERSHED RESTORATION ON WATER AVAILABILITY AND TIME SPENT FETCHING DRINKING WATER

Village	Drinking Water Used (liters/household/day)			Time Spent Fetching Drinking Water (hours/household/day)		
	Before Restoration	After Restoration	% Change	Before Restoration	After Restoration	% Change
	Mallapuram	10.5	11.9	13%	10.5	11.9
S. Rangapuram	10.7	12.8	20%	10.7	12.8	20%
Tipraspalle	11.8	14.3	21%	11.8	14.3	21%
Mamidimada	12.2	14.3	17%	12.2	14.3	17%

Source: Reddy et al. 2004

Several successes highlighted in this portion of the book show the potential for **community-based management** to empower and enrich local communities and still manage ecosystems well. But CBNRM is no panacea, and it is by no means always pro-poor. Both the power and benefits associated with community management tend to be directed toward higher income classes unless specific accommodations are made. In pursuing pro-poor CBNRM, communities, governments, and NGOs must keep in mind several points:

TABLE 4.1 RECENT LEGAL REFORMS STRENGTHENING COMMUNITY FOREST TENURE IN DEVELOPING COUNTRIES

Country	Year Enacted	Key Features of Reform
Bolivia	1996	Ancestral rights of community groups have precedence over forest concessions. Subsequent laws have strengthened community rights.
Brazil	1988	Constitution recognizes ancestral rights over land areas that indigenous groups and former slave communities traditionally occupied. Federal government is responsible for demarcating indigenous reserves on public lands and protecting land rights of indigenous groups.
Colombia	1991	Constitution of 1991 recognizes and outlines a framework for collective territorial rights for indigenous groups and Afro-Colombian traditional communities.
Indonesia	2000	New regulatory process has been recently established by which customary ownership can be recognized.
Mozambique	1997	Titles for customary rights are available.
Philippines	1997	Constitution of 1987 protects ancestral domain rights. Indigenous Peoples Rights Act of 1997 provides legal recognition of ancestral domain rights pursuant to indigenous concepts of ownership.
Tanzania	1999	Customary tenure is given statutory protection whether registered or not. Titles for customary rights are available.
Uganda	2000	2000 draft law currently under revisions. Government is embarking on an ambitious program of devolution to district and local councils.

Source: White and Martin 2002; used with permission, copyright Forest-Trends 2002

The goal of devolving control over natural resource management from the national level to the local level is to give local residents a stake in management, thus increasing its effectiveness and equity. But the state still plays an essential role in helping such local management to succeed. For example, it is the state that must put in place the policy and legal framework to allow local management to take place at all. In addition, the state has a special responsibility to look beyond the level of community management to make sure that broader environmental standards are upheld and management efforts are coordinated. The state can also help local management to become a source of substantial income through training and capacity building, as well as deploying its more traditional economic development tools of transport, marketing, and credit assistance.

3. COMMERCIALIZING ECOSYSTEM GOODS AND SERVICES

Success at managing ecosystems can bring the poor higher agricultural yields, more fodder, and higher fish catches. Success at creating local institutions that serve the poor can bring a fairer distribution of this enhanced productivity. But these steps alone do not necessarily bring wealth. They may enrich the household diet and stabilize daily subsistence, but they do not assure the kind of cash income that aids the transition out of poverty. That usually requires successful commerce. Success at commercializing ecosystem goods and services often marks the difference between using nature as a low-income livelihood support and making it a substantial source of cash and a path to the accumulation of economic assets. There are several important elements to successful commercialization:

Product processing, marketing, transport, and sales are the main aspects of commercialization. While emphasis is often placed on the process of production itself—the farming, fishing, or collection of wild products – the importance of **the commercialization process** is sometimes under-appreciated. That’s unfortunate, because commercialization factors are the most frequent obstacles to higher cash income from ecosystems. A recent study in *Mexico* and *Bolivia* found that marketing and sales – not production issues – were the main constraints to successfully turning nontimber forest products like resins, basket-weaving materials, honey, bamboo, and bark into successful commercial products.

Rural areas are notoriously difficult to reach. Roads and rail links are usually scarce, often in disrepair, and frequently impassable. This puts **transportation** high on the list of critical factors determining the commercial viability of ecosystem goods and services that the rural poor may wish to market. In the remote *Iquitos region of Peru*, for example, transportation costs are often the deciding factor in what is marketed.

One of the most frequently cited constraints to commercializing environmental goods is a lack of **financial services** such as loans or credit. Credit is simply unavailable in many rural settings, handicapping the ability of the poor to use their environmental assets. By one estimate, 500 million economically active poor families have no access to credit or other financial services. Without access to credit, the poor must rely on their own savings to capitalize their enterprises, but these are frequently inadequate to fully exploit their economic opportunities.

Increasing the **economic return** that the poor realize from nature-based products is an important element in any strategy to use nature for poverty reduction. Many of the goods that the poor produce or obtain from nature yield low prices relative to the labor involved. Changing this involves action at three different levels.

CAPITALIZING ON THE COMPETITIVE ADVANTAGES OF THE POOR

Although they suffer some obvious disadvantages, small rural producers also hold some competitive advantages that can help them successfully commercialize their ecosystem assets. Exploiting these advantages increases their economic leverage.

- **Control of commercially valuable forest resources, land, or fishing rights.** Poor households and communities with well-established resource tenure are sometimes in a position to parlay this into commercial opportunities. This is especially true for those communities within reasonable proximity of expanding centers of domestic or industrial demand, such as inland cities far from commercial ports. Constraints on the private sector's ability to meet wood demand in India, for example, have motivated more than a dozen companies to partner with rural farmers to grow trees on the farmers' lands (Mayers and Vermeulen 2002:45; Scherr et al. 2002:4-5).
- **Lower cost structure for some products.** For communities or farmers with excess labor or land not currently under crops, there may be little opportunity cost for growing trees or establishing low-tech aquaculture ponds. These operations may have lower costs than large-scale plantations or high-tech fish-raising enterprises run by outside business interests. Agroforestry systems, for example, may offer lower costs for tree production because trees are produced jointly with crops and livestock. For products like wood fuel and charcoal, transportation costs even from rural communities may be lower than importing these commodities from international markets (Scherr et al. 2002:4-5).
- **Sole providers of some products.** Because of their access to ecosystems and their traditional knowledge, poor households may be in the

best position to supply some niche markets, such as for medicinal plants, exotic fruits, or traditionally made handicrafts or art objects. They may also be in the best position to sell to "socially responsible" markets, which may value the fact that their products come from small community enterprises rather than factory farms or plantations (Scherr et al. 2002:4-5).

- **Ability to compete in domestic markets for some products.** Low-income producers may not always be able to be competitive in international trade, but they can frequently compete effectively in domestic markets. This is particularly true for certain products that do not offer high margins, such as "commodity grade" wood used for fencing, storage structures, crop and tree supports, or packing crates. Larger international producers typically do not compete in these markets with cheaper domestic products, which small-scale farmers can in many cases supply by growing trees in agroforestry schemes or wood lots (Scherr et al. 2002:4-5).
- **Better monitoring and enforcement abilities.** Local people may have greater ability than outside companies to prevent illegal logging or fishing. This may mean they are in a better position to assure the quality of certified wood or fish products (Scherr et al. 2002:4-5).

In general, low-income communities will find it easier to compete in commercial markets where there is less competition with large-scale producers, where there are few substitutes for their goods, where their low labor and start-up costs give them a lower overall cost structure, and where their deficits in transport are minimized.

It is hard to imagine successfully commercializing ecosystem goods and services without substantial participation of the **private sector**. The capital, facilities, know-how, and markets that businesses command make them strong potential investors and partners for nature-based enterprises of the poor. In *Southwestern Ghana*, the Swiss Lumber Company has entered into contracts with rural farmers to grow hardwoods on degraded lands, where they will not compete with agriculture. The company provides a lump-sum down payment, a 20-50 percent share (depending on the size of the down payment) of the timber at harvest, and an annual land rent. In return, Swiss Lumber – which does not own timber lands or have access to government timber concessions in the area—gets first option to buy the timber at market prices when the trees are ready for harvest.

Success in commercializing an ecosystem good or service creates its own problems. If a poor household or a rural community finds a winning formula for production, marketing, and delivery of a nature-based product, the temptation will be to push the formula to its limits to increase sales and income. This can easily lead to overexploitation of the type that typically degrades ecosystems. Reconciling the desire to maximize income with the need to **sustain ecosystems** so that they remain productive assets is one of the inherent challenges of using environmental income for poverty reduction.

4. AUGMENTING NATURE'S INCOME STREAM: PAYMENT FOR ENVIRONMENTAL SERVICES

When the poor engage in good ecosystem stewardship, they create the conditions for higher productivity and greater direct environmental income for themselves. But they also safeguard ecosystem services whose benefits extend beyond their immediate surroundings. By maintaining a healthy forest cover, for example, they are helping to preserve watershed services like flood control, continuous water supply, and erosion control that landowners downstream will benefit from. In the past, these services have been considered “public goods” and available for free, but in recent years it has become clear that many of these ecosystem services have a quantifiable economic value. If people downstream are being regularly flooded, the ability of the intact forest to moderate stream flows and lessen the flood risk will be worth something to them, and they may be willing to pay the upstream forest owners to preserve and protect this service—or even to restore it.

In the last decade or so, markets based on this kind of interchange – called payment for environmental services (PES) – have begun to develop worldwide. (*See Table 4.2.*) The most common environmental services marketed so far have been associated with forests and fall into four categories: watershed services like those described above, carbon storage, biodiversity conservation, and preservation of landscape beauty. Since the poor are the stewards of many rural ecosystems, it makes sense that they should be able to tap these payments for environmental services (PES) as an additional source of environmental income – another element of their “nature portfolio.” In a few cases, they have been successful in doing so. But for the most part, the markets for environmental services, which are still in their infancy, do not yet serve the poor well.

In this chapter, we have explored a **bottom-up approach** to generating environmental income by the poor. We have emphasized that better ecosystem management and a realignment of local resource governance to empower the poor can lead to significant increases in their household incomes. It is a strategy grounded in the belief that rural poverty reduction can begin with nature—the resource and employment base that already supports rural livelihoods.

At the same time, we realize that poverty reduction depends on many factors beyond our discussion in this chapter. For example, we have emphasized that good ecosystem management combined with effective commercialization of nature-based products helps reduce income risks for low-income families. But poor families face risks other than inadequate or uneven income, such as the risk of catastrophic loss from natural disasters or health shocks. Without mitigating these risks as well—through interventions such as crop insurance and access to better health care – the poor will not find a stable economic foundation in spite of good stewardship of their ecosystem assets.

Likewise, access to technology is another important factor we have only lightly touched on. Many examples show that innovations in technology and management practices have the potential to increase environmental income substantially, but there are considerable

barriers to adoption of such innovations. For example, researchers in *Brazil* have found that a combination of planting legumes to enrich pasture soils and using solar-powered electric fences to better control where cattle graze on a given pasture could allow smallholders to sustainably double milk production and triple the carrying capacity of their land, bringing a marked increase in profits. But lack of credit and training, distance from markets, and lack of political commitment to extension programs means that few Brazilian farmers are likely to benefit from these innovations. Under the present economic incentives, poor farmers are likely to continue with their usual practices.

This brings up the larger point that rural enterprises, although they may be physically remote, are connected to the national economy – and increasingly to the global economy – and therefore subject to macroeconomic and governance policies originating far from the village level. (*See Box 4.5.*) Without pro-poor policy changes at these higher levels, the ability of the poor to deploy their ecosystem resources for greater income will be greatly attenuated. For example, national fisheries ministries typically concentrate their attention and budgets on industrial fisheries, ignoring the small-scale fisheries that the poor rely on. Without changing this dynamic, the poor will find their attempts at better ecosystem management frustrated by official inattention. Likewise, without high-level action to make credit and other financial services available for small rural enterprises, the poor will find it hard to capitalize on their governance and management successes.

On the other hand, this chapter shows that governments can create a foundation for greater environmental income by providing incentives for nature-based enterprises, empowering the poor by granting legally binding resource rights, and fostering responsive local institutions. In fact, as the case studies in Chapter 5 show, a high-level political commitment to expanding environmental income through local empowerment is crucial to scaling up village-level successes. When this happens, region-wide improvements in management practice and governance can occur that provide the poor a first step in economic advancement.

NOTE

The press packet contains summaries of three out of the five **case studies** covered in Chapter 5. The summarized case studies are: “Nature in Local Hands: The Case for Namibia’s Conservancies,” “More Water, More Wealth in Darewadi Village,” and “Village by Village: Recovering Fiji’s Coastal Fisheries.”

The full versions of these case studies, as well as two others (“Regenerating Woodlands: Tanzania’s HASHI Project” and “Bearing Witness: Empowering Indonesian Communities to Fight Illegal Logging”) can be found in the full text of *World Resources 2005*.

A **special section** in the full version of *World Resources 2005* details how to make Millennium Development Goals (MDGs) and Poverty Reduction Strategies (PRSPs) work for the poor and the environment. This special section deals with innovations in poverty policies at these larger scales. In the past five years, two developments have raised hopes that national governments and multilateral institutions can be mobilized to address world poverty: the establishment of the **Millennium Development Goals** (MDGs) and the crafting of national **Poverty Reduction Strategies** (PRSPs). In this section, we explore how the concepts of environmental income and pro-poor environmental governance apply to these efforts. A key link between MDG and PRSP processes and the world’s poor is the environment. The central question is: Do the Millennium Development Goals and the current crop of Poverty Reduction Strategies incorporate the environment and governance as central features in fighting poverty? And if not, how can they be made to incorporate these themes?