Rural and urban development can bring relief to more than 1.2 billion poor. But only with more attention to the links between development and the environment, including the environment's impact on health and the productive capacity of natural resources, can development be sustainable.

More people are using more natural resources than ever, and demand will only increase. Food supply needs to double in the next 35 years to satisfy the growth of populations and economies. This will happen, to a large extent, at the expense of forests, wetlands, and biodiversity. More than a fifth of the world's tropical forests have been cleared since 1960, and at least 484 animal species and 654 plant species have become extinct since 1600 (Watson and others 1998).

Water stress and water scarcity affect almost half a billion people; in 25 years that number will rise to 3 billion. Without efficient management, existing freshwater supply cannot meet the needs of growing populations in many countries. Millions of people die every year from contaminated water—almost all of them in low- and middle-income countries. And the irony is that the poor pay more than the rich for potable water (World Bank 1999d).

To balance demand for growth and the use of resources and to monitor their environmental impact, we need information on how the environment is changing and how its degradation affects the poor—in both rural and urban areas. But lack of meaningful data with meaningful breakdowns constrains the efforts to address the consequences of rural and urban development.

Rural development should preserve the environment

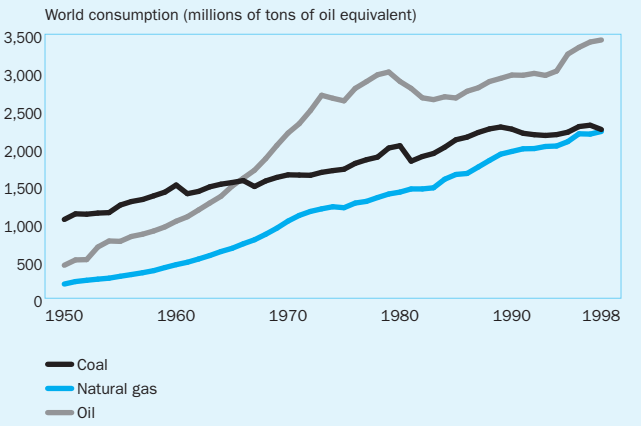
Poverty is overwhelmingly rural, with about 70 percent of the poorest people in developing countries in rural areas. Although the number and proportion of poor people in cities are expected to grow rapidly in the next decades, the majority of the poor will continue to live in the countryside. Reducing poverty and ending hunger thus requires more attention to the rural economy and rural development.

Environmental problems affect the poor for several reasons. Dirty water and dirty air are major causes of diarrhea and respiratory infections, the two biggest killers of poor children. And standing water and accumulated solid waste promote the transmission of malaria and dengue fever.

Poor people are often more vulnerable to environmental changes because they use natural resources directly and because they have fewer alternative

Figure 3a

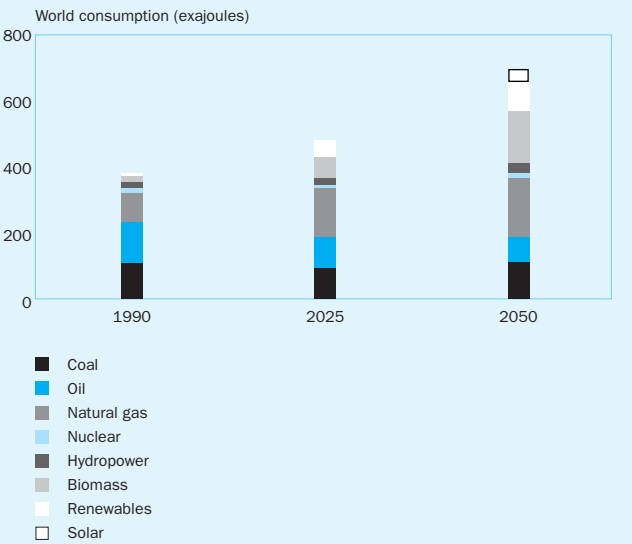
The world has shifted toward cleaner energy . . .



Source: Brown and others 1999.

Figure 3b

. . . and the trend is expected to continue



Note: One exajoule is 10^{18} joules.

Source: Intergovernmental Panel on Climate Change 1996.

ways to earn income, fewer alternative places to live, and fewer mechanisms for coping with shocks. And the rural poor are vulnerable because they often live on marginal land and in unstable housing—places most susceptible to natural disasters and extreme weather.

Agricultural production—now keeping pace with population growth in developing countries—contributes to environmental degradation and suffers from it. Unsustainable farming methods—such as the excessive use of pesticides and fertilizer—reduce biodiversity, degrade soil, and pollute water. In some parts of the world poor farming techniques are the leading cause of deforestation, as farmers continually seek to expand their landholdings and improve their economic condition.

Environmental damage can also harm agriculture. The destruction of watersheds dries up sources of irrigation, while pollution destroys fisheries and reduces crop yields. These lead to increased use of marginal land, reducing production and perpetuating poverty for those whose livelihood depends on agriculture.

Urban development brings pollution and congestion in its wake, affecting the poor most of all

More than 2.7 billion people (almost half the world's population) live in urban areas, a number projected to reach 5.1 billion by 2030, with 98 percent of the increase taking place in developing countries. With increasing inequality between the north and the south, growing urbanization will have far-reaching consequences. Already close to 30 percent of the developing world's urban population lives below the poverty line.

The ability of cities to reap the benefits of economic growth and sustainable development will depend largely on their success in improving the quality of life—and the quality of the environment—for this growing number of urban poor. Traffic congestion in urban areas affects health, economic productivity, and quality of life. In Bangkok about half a billion dollars a year could be saved just by making peak hour traffic move 10 percent faster. The costs to health are even higher: the annual price of dust and lead pollution in Bangkok, Jakarta, and Kuala Lumpur has been estimated at $5 billion, or about 10 percent of city income (World Bank 1996a).

Just as the rural poor suffer more from pollution than their wealthy neighbors, so the urban poor bear the brunt of urban pollution. In Indonesia researchers found that factories in municipalities in the bottom quartile of income and education have organic pollution 15 times as intense as plants in communities in the top quartile. Rio de Janeiro and São Paulo also show that pollution-intensive industry dominates in poorer municipalities (World Bank 1999b).

In China the density of suspended particulate pollution rises as wages fall. Why this tragic association between poverty and pollution? Industrial production in richer areas is cleaner because citizen feedback is strong and regulation tight. Industrial facilities in areas with unskilled workers generally operate at lower efficiency and create more waste. Another cause of the disparity is the poor's lack of access to cleaner sources of energy.

No country has developed much beyond a subsistence economy without ensuring access to energy services for a large segment of its population. At the same time, providing energy services—especially through combustion of fossil fuels and biomass—can harm the environment. And this harms the poor, who must rely on inefficient and polluting sources of energy for lack of better alternatives (tables 3.7, 3.8, and 3.9). In cities, burning coal and other dirty fuels for household heating and small-scale commercial and industrial activity causes smog and acid rain. And in rural areas, burning traditional fuels in ill-designed stoves or hearths causes indoor air pollution, which damages the health of women and children.

The World Energy Council (1995) forecasts that energy use will grow 1.4 percent a year until 2020, 2.6 percent a year in devel-

Box 3a

Monitoring progress in rural development

As economies develop and incomes rise, people use a smaller share of their income for food and raw materials, and the share of agricultural and other natural resource–based activities in the economy declines. Although not the only economic activity in rural areas, agriculture is the backbone of all but the most advanced economies. Its relative decline is the primary reason for the decline in the rural population share and the high incidence of rural poverty in most countries.

Rural development is the outcome of all productive activities in rural areas—agricultural and nonagricultural. It improves the livelihood and well-being of rural people. To understand the link between rural development and rural well-being, a comprehensive view reflecting both the process of rural development and the progress toward rural well-being must be articulated. The World Bank is developing a framework for monitoring progress in rural development and rural well-being that focuses on three key development goals: an improved rural economy, a sustainable natural resource base, and sound institutions and governance.

Progress toward each goal will be monitored using a set of indicators, with poverty reduction a proxy for rural well-being. Poverty must be tackled not only by increasing incomes but also by enhancing equity and improving access to basic services. The framework emphasizes the following tasks:

- Reduce the proportion of the rural population with incomes below the poverty level.
- Improve social and physical well-being.
- Foster human development.
- Foster gender equity.
- Enhance food security.

The work on this monitoring framework has brought to the fore the immense problems in the availability, quality, and reliability of rural data in most developing countries.

Box 3b

International goal for environmental sustainability and regeneration

The international community has set a goal of implementing national strategies for sustainable development by 2005 to reverse the loss of environmental resources globally and nationally by 2015. To monitor progress toward this goal, a joint OECD–United Nations–World Bank working group has suggested the following set of indicators:

- Existence of a national strategy for sustainable development.
- Population with access to safe water.
- Land area protected.
- GDP per unit of energy use.
- Per capita carbon dioxide emissions.
- Forest area.

oping countries. This growth has major environmental implications, particularly for the level of pollution and for future emissions of greenhouse gases and their likely impact on climate change. Fortunately, the recent shift toward cleaner energy sources is expected to continue (figures 3a and 3b). But even in scenarios with fairly optimistic assumptions about the growth of hydropower and other forms of renewable energy, carbon emissions from burning fossil fuels are predicted to double by 2050.

Strike a balance between growth and resource use by measuring and monitoring

Successful rural and urban development requires close monitoring of the impact of policy. Monitoring requires meaningful data broken down along rural and urban lines, reflecting the different characteristics of rural and urban development. But today's coverage of rural and environmental indicators is sparse.

Another problem: many environmental indicators have little meaning at the national level. Some national activities have transnational consequences, and some environmental issues are highly localized and location specific. So in many cases global, regional, or rural and city indicators are more meaningful than national aggregates (tables 3.11 and 3.13). Moreover, even on a national level many relevant indicators cannot be compiled because adequate or comparable data are lacking. And many do not capture depletion of natural resources—a serious constraint on measuring the state of the environment and designing sound policies.

Another policy-relevant issue is how to present national accounts and thus economic growth. Because the standard national account estimates do not reflect environmental depletion and degradation, they often send false policy signals to nations aiming for environmentally sustainable development. "Green GNP," which integrates environmental depletion and degradation, is one indicator gaining currency. While a greener measure of GNP would have some policy use, a related measure—genuine savings (table 3.15)—gets directly to the question of whether a country is on a sustainable path, making the data more useful for policymakers. The genuine savings measure links environment and economy by accounting for depletion and degradation of natural resources.

To examine the links between growth, environment, and poverty and the role of rural development in reducing poverty and improving rural well-being, new approaches to monitoring rural development, resource use, and environmental sustainability are being developed (boxes 3a and 3b). World Bank publications contribute to this work. *Rural Development: From Vision to Action*—a broad strategy to develop rural economies—identifies four goals that a country can use to assess its rural development (World Bank 1997e). *Fuel for Thought: Environmental Strategy for the Energy Sector* attempts to improve understanding of the nexus of energy and the environment (World Bank 1999a). And a new environmental strategy emphasizes understanding the contribution of environmental activities to poverty reduction.