



Poverty in a Broader Context

In this penultimate chapter, we come full circle to the broad-based discussion of poverty in our initial chapters. Although the model-based findings and analysis from the intervening chapters inform our discussion, they do not confine us. This allows us to take stock of what we have been able to accomplish, as well as to lay out issues that await research and analysis in the future.

In this spirit, we focus on a few substantive elaborations of the analysis in previous chapters. We expand the discussion by including attention to aspects of proximate and deep drivers that currently challenge or even defy quantitative measurement and analysis and by broadening the focus from drivers of poverty to impacts of poverty. Among the topics that deserve greater attention than past chapters afforded them are the implications of natural resources and the environment for poverty reduction, as well as the consequences of poverty levels for the environment. Similarly, conflict/stability and governance/sociopolitical institutions

have consequences for poverty and, in turn, are influenced by poverty. An ancillary topic for discussion is the external involvement of governments, intergovernmental organizations, and other actors in poverty reduction efforts; such involvement has a wide range of consequences and trade-offs.

Natural Resources, the Environment, and Poverty

We recognize that poverty, environmental degradation, and population growth are inextricably related and that none of these fundamental problems can be successfully addressed in isolation. We will succeed or fail together. (World Commission on Environment and Development 1987: 45)

Investment in environmental assets is essential for poverty reduction. (Poverty-Environment Partnership 2005c)¹

● *Many phenomena that we cannot model affect and are, in turn, influenced by poverty.* ●

Eliminating poverty and hunger and protecting the environment are inseparable. (Kermal Davis, UNDP administrator, at the launch of the joint UNEP and UNDP Poverty and Environment Facility, 2007)²

In this section we turn to the linkages between poverty and natural resources and the environment. What are they, and what might be their implications for the earlier analysis in this volume?

We best know the World Commission on Environment and Development (WCED) for popularizing the term **sustainable development**, defined as development that “meets the needs of the present without compromising the ability of future generations to meet their own needs.” At the same time, the quotation from the WCED indicates that the commission clearly understood the fundamental relationship between poverty and the environment in the present as well as the future.

Many other bodies have recognized these connections, including the 1992 United Nations Conference on Environment and Development, the 2000 Global Ministerial Forum, the 2000 Millennium Summit, the 2002 World Summit on Sustainable Development, and the 2005 World Summit. This recognition, along with the establishment of Millennium Development Goals (MDGs) and assorted formal resolutions, has led to the establishment of institutions and networks to consider the relationships between poverty and the environment.³ A key example is the Poverty and Environment Initiative (PEI) of the UN Development Programme (UNDP) and the UN Environment Programme (UNEP).⁴ This partnership, established in 2005 to scale up investment and capacity development support for mainstreaming the environment in country-led MDG processes, has garnered further support, in part through the setting up of the joint UNEP and UNDP Poverty and Environment Facility in Nairobi. Less formal, but working closely with the PEI, is the Poverty-Environment Partnership (PEP), a network of development agencies established in 2001.⁵

The role of the environment in poverty reduction has also received attention in the World Bank’s guidance documents on poverty reduction strategies (Bojö et al. 2002), the work of the UN Millennium Project (UN Millennium Project 2005), the establishment of

the Poverty and Environment Program of the Asian Development Bank, and country-specific analyses of the relationships between poverty reduction and environmental priorities (see, for example, Sánchez-Triana, Ahmed, and Awe 2007). The Millennium Development Goals formally recognize the poverty-environment connection, most directly in the goal of ensuring environmental sustainability, but the quality of the natural environment also strongly influences many of the other goals. The survey of policies to reduce poverty in Chapter 3 of this report, as summarized in Table 3.1, also includes, inter alia, policies to enhance the quality of the environment and protect natural resources.

The next subsection conceptualizes the relationship between poverty and the environment, paying careful attention to the role of the natural environment as a source of assets, in the form of goods and services, for individuals and society. That beginning leads to an exploration of the links between this general understanding and the deep and proximate drivers of poverty. We then consider how more careful attention to the natural environment would enhance our understanding of these drivers and the subsequent analysis of plausible futures for their evolution and therefore the evolution of poverty itself.

Conceptualizing the links between poverty and the environment

Underpinning the more directly policy-related efforts noted above has been (1) the development of frameworks to help conceptualize the connections between poverty and the environment and (2) empirical analyses aimed at better understanding how they are manifested in the real world.⁶ The frameworks see the relationship between poverty and the environment as being inherently bidirectional. On one side, a healthy, functioning environment is a prerequisite for poverty reduction; on the other, poverty can force people to behave in such a way as to degrade the environment upon which they depend. The potential for poverty and environmental degradation to feed upon each other in a negative fashion has been referred to as a “poverty trap” (Carter et al. 2007; Prakash 1997), “downward spiral” (Durning 1989; Scherr 2000), and perhaps most ominously, an “optimal path to extinction” (Perrings 1989).

● An increasing range of institutions address the poverty-environment nexus. ●

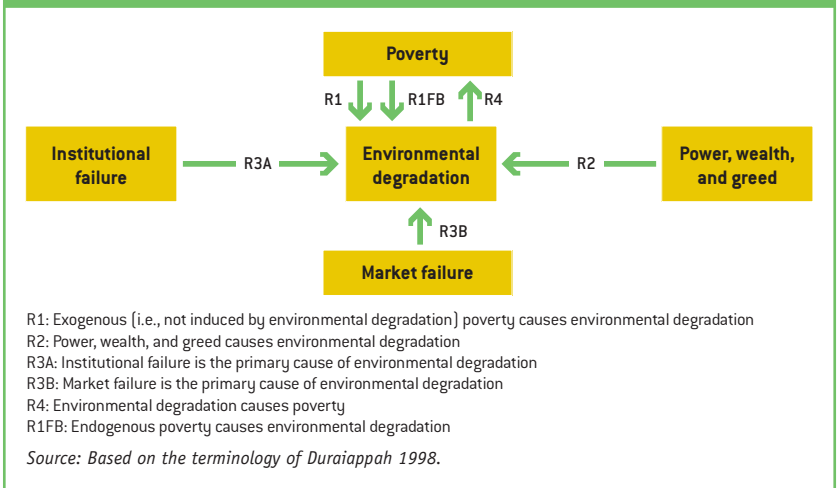
The story is, however, not so simple. We cannot ignore social, political, and cultural factors in explaining the complex web of relationships between people and their environment.⁷ Figure 9.1 illustrates the possible relationships in what is increasingly referred to as the poverty-environment nexus.⁸

In this particular conceptualization, the feedback loop shown by R1FB and R4 reflects the orthodox view of poverty leading to environmental degradation and vice versa. Relationships R2, R3A and R3B highlight the fact that environmental degradation can have many other root causes: power, wealth, and greed; institutional failures; and market failures. Furthermore, via R4, those causes can further affect poverty.⁹

The adoption of a more complex perspective on the poverty-environment nexus also belies the common assumption of an inherent trade-off between poverty alleviation and environmental protection.¹⁰ At the heart of this perspective is the recognition that, through its interactions with individuals and society, the natural environment provides assets that are fundamental to all social and economic development but are of particular importance to the poorest persons in society.¹¹

Beginning with Rudolf S. de Groot (1992) and Gretchen C. Daily (1997), a number of efforts have been made to define and spell out the goods and services that the natural environment provides (see Boyd and Banzhaf 2006 for a recent review). Perhaps the most influential is the approach that the Millennium Ecosystem Assessment (MA) spelled out, using the term “ecosystem services.” The MA defines them as “the benefits people

Figure 9.1 Possible relationships in the poverty-environment nexus



obtain from ecosystems” (Millennium Ecosystem Assessment 2003: 211). It distinguishes four categories of services—provisioning, regulating, cultural, and supporting—as shown in Table 9.1.

Some of the goods and services provided by the natural environment contribute directly to people. Others contribute indirectly by allowing for the continued provision of other goods and services. The direct contributions can involve either transformative or nontransformative uses of the environment. In the case of the former (provisioning services), such as the provision of firewood for cooking or providing warmth, there is a physical change in the environment; with the latter (cultural services), such as a birdsong that brings joy to those who hear it, there is not. The indirect contributions derive from services that allow for the continued provision

● The poverty-environment nexus involves many other forces, including governance, markets, and social relationships. ●

Table 9.1 Ecosystem services as defined in the Millennium Ecosystem Assessment

Ecosystem Services		
Provisioning Services <i>Products obtained from ecosystems</i> <ul style="list-style-type: none"> • Food • Freshwater • Fuelwood • Fiber • Biochemicals • Genetic resources 	Regulating Services <i>Benefits obtained from regulation of ecosystem processes</i> <ul style="list-style-type: none"> • Climate regulation • Disease regulation • Water regulation • Water purification 	Cultural Services <i>Nonmaterial benefits obtained from ecosystems</i> <ul style="list-style-type: none"> • Spiritual and religious • Recreation and ecotourism • Aesthetic • Inspirational • Educational • Sense of place • Cultural heritage
Supporting Services <i>Services necessary for the production of all other ecosystem services</i> <ul style="list-style-type: none"> • Soil formation • Nutrient cycling • Primary production 		

Source: Millennium Ecosystem Assessment 2003: 57.

● **Conceptualizing environmental goods and services helps us understand their linkage with poverty.** ●

of other services. These other services may themselves contribute either directly (regulating services) or indirectly (supporting services) to human well-being. For example, consider the purification of water: the purified water may be directly consumed, but it may also support a fish population that is a source of protein. Finally, please note that the contributions from the environment need not always be beneficial to human well-being. Dirty air and water, not to mention events such as hurricanes or a snake bite, can negatively affect human well-being.

The approach used in the MA explicitly focuses on biological resources that are renewable over relatively short time scales. Note the careful use of the term “fuelwood” rather than “fuel” in Table 9.1. Similarly, the concept of ecosystem services does not include minerals and metals. Thus it does not include key aspects of natural capital as defined in Chapter 3 of this report. (Although that chapter defined natural capital broadly, the forecasts of poverty in this report by no means fully reflect the elements in that definition.) For this reason we use the term “environmental goods and services,” rather than either “ecosystem services” or “natural capital,” to represent the full range of contributions from the natural environment.

Connecting the environment to the drivers of poverty

Chapter 3 of this report explored the deep and proximate drivers of poverty. It specified the latter as levels of economic activity, population, and inequality, with changes in them driving changes in poverty. In turn, it examined the deep drivers of each of the proximate drivers, which later chapters then used as the basis for exploring plausible futures of poverty. A number of the deep drivers of poverty depend strongly upon environmental goods and services. In turn, poverty itself, and efforts to eradicate it, positively or negatively affect a number of environmental goods and services.

This subsection will focus on various ways in which increased attention to the role of the environment could enhance the projections of plausible futures of poverty, specifically (1) environmental goods and services as determinants of health, including fertility and mortality; (2) environmental goods and services as actual products or components of products;

and (3) environmental goods and services as general factors of production. Finally, it will separately address the particular relationship of the environment and inequality.

Health, including fertility and mortality

Through its program on quantifying environmental health impacts, the World Health Organization (WHO) has been producing a series of publications on the environmental burden of disease, including country profiles.¹² Since the World Summit on Sustainable Development in 2002, WHO has also partnered with UNEP in carrying out the Health and Environment Linkages Initiative (HELI), a global effort “to support action by developing country policymakers on environmental threats to health”.¹³

Annette Prüss-Üstün and Carlos Corvalán (2006) estimate that globally 24 percent of the disease burden (healthy life years lost) and 23 percent of all deaths (premature mortality) are attributable to environmental factors; among children up to age fourteen, the figure for deaths is as high as 36 percent. The diseases with the largest absolute burden attributable to modifiable environmental factors are diarrhea, lower respiratory infections, “other” unintentional injuries (workplace hazards, radiation, and industrial accidents), and malaria. Related to this, HELI identified the priority environment and health risks as vector-borne diseases, urban air pollution, indoor air pollution, unsafe water and sanitation, climate change, and toxic substances. It is not surprising that many of these same concerns appear in the Millennium Development Goals. Various studies, such as John Luke Gallup and Jeffrey Sachs (2001), Sachs and Pia Malaney (2002) and Yohe et al. (2007), have attempted to estimate the economic and social costs of a number of these environmentally related health risks.

Turning to the conceptual framework used to project future economic activity and poverty in this report, Figure 3.6 showed health as an input into human capital, which in turn influences multifactor productivity and economic growth. (The figure leaves implicit the importance of the size of the population, as well as its general health, for the labor supply.) Figure 3.7 highlighted the roles of fertility and mortality in determining population, but, somewhat surprisingly, it shows health explicitly only

in terms of the impact of health spending on mortality. Significantly, neither of these figures draws attention to the role of the environment. Furthermore, although increased mortality can reduce the labor supply and life expectancy influences human capital, the potential impact of morbidity on economic activity, and therefore poverty, is missing.

In its current form, IFs captures limited impacts of environmental change on health. It represents a linkage from food availability to malnutrition levels, which in turn affects the human poverty index, but does not consider other impacts.

Environmental goods and services as actual products or components of products

In the form of provisioning and cultural services (food, timber, fossil fuels, and recreational opportunities), environmental goods and services have traditionally provided economic commodities, thereby making a direct contribution to economic activity and economic growth. Environmental goods and services are also the basic building blocks of many other products (clothing, furniture, and pharmaceuticals). With the advent of more recent institutions, such as markets for greenhouse gas credits, even some regulating and supporting services are beginning to enter economic markets directly.

IFs makes some attempt to incorporate the role of environmental goods and services as economic commodities or components of economic commodities. Three of its six economic sectors are agriculture, primary energy, and raw materials, which directly embed environmental goods and services into their products. An input-output structure connects these sectors to each other and to the three other sectors of the model. Theoretically, restrictions on environmental goods and services could therefore affect the ability to constitute other goods and services. With one exception, however, the model does not attempt to represent such constraints, partly because of the highly aggregate nature of these sectors. The single exception is that, if energy supplies are abruptly reduced (as by the shocks of the 1970s), the ability to constitute other goods drops proportionately. More generally, however, the model looks to the availability of environmental goods and services, especially energy, as a factor

of production that may influence economic activity and, in turn, poverty.

Environmental goods and services as general factors of production

Even when they do not appear as products or components of products, environmental goods and services play a key role as general factors of production. Energy may be the most obvious example, but those aspects of a quality environment hinted at by the supporting and regulating services (healthy air, water, and soil and a relatively stable and predictable climate) are also significant factors of production for many economy sectors.

Figure 3.6 identified six forms of capital as being fundamental to economic activity and growth.¹⁴ Of these, only natural capital is, on the surface, directly related to the natural environment. One other— infrastructure capital—clearly traces its roots back to the natural environment, however, because its physical form consists of transformed parts of the natural environment. Finally, human, social, institutional, and knowledge capital, as well as labor, are embedded in single individuals or groups of individuals, who also ultimately depend on the natural environment for their continued existence. Thus environmental goods and services theoretically support all factors of production.

Within IFs, separate agriculture and energy modules represent physical production based on physical factor inputs. For instance, land withdrawn for urban use is unavailable for agricultural production, and depletion of nonrenewable energy resources ultimately constrains production of them. Thus environmental goods and services directly shape production of those sectors.¹⁵ In addition, the price of energy directly enters into the calculation of broader productivity for all sectors, representing the rendering of some capital obsolescent when energy prices rise. In addition, climate, via changes in the levels of atmospheric carbon dioxide, has the potential to influence crop yields, but only via scenarios introduced by users willing to specify the parameters for the linkage.

Thus the representations of IFs omit much in the potential representation of environmental goods and services in economic production. For example, the model ignores the potential

● *Environmental goods and services contribute much to economic growth.* ●

■ *Environmental change often especially disadvantages the poor.* ■

impacts from changing temperature and precipitation patterns. Similarly, it does not consider explicitly the role of other key environmental factors (water availability, water quality, land quality, and air quality). To the extent that these influence economic activity, and therefore poverty, the results presented in this report may be misleading.

Inequality

Thus far, we have dealt with the role of the environment at a fairly macro level, emphasizing in particular its potential impact on overall economic activity and, to a lesser extent, population. Perhaps even more significant, though, is the role the environment can play with respect to inequality, the third proximate driver of poverty.

Poorer people, particularly in rural areas of developing countries, heavily depend upon environmental goods and services for their livelihoods (e.g., Cavendish 1999b, 2000; Narain, Gupta, and van 't Veld 2005; Nunan et al. 2002; Poverty-Environment Partnership 2005a, 2005b, 2005c; World Resources Institute 2005). In addition, the poor often suffer from unequal rights and insecure access to these resources (Poverty-Environment Partnership 2005a, 2005b, 2005c). Related to that is the importance for the poor of resources they hold in common. Further, the poor tend to live in more ecologically fragile areas (Narain, Gupta, and van 't Veld 2005; World Resources Institute 2005), making them the most vulnerable to human-made and natural disasters (Department for International Development 2002; Scott 2006).

Finally, even among the poor, the links between poverty and the environment varies across different groups. Bina Agarwal (1997) and the Organization for Economic Cooperation and Development (OECD 2001) have explored the links among gender, poverty, and the environment. Some mechanisms by which their relationship to the environment may more substantially affect women and children than men are fairly straightforward, such as less access to private resources and greater exposure to indoor air pollution. Others are subtler, such as the fact that environmental degradation increases burden on women and children, especially girls, to collect water and fuel wood, reducing time for education and income-generating activities.

Taken together, all these factors suggest that environmental changes may result in changes in the distribution of income within a country and not just average levels of income. This potential for environmental change to influence the distribution of income adds to the vulnerability of the poorest segments of society. The discussion in Chapter 3 on the deep drivers of inequality does not really address that potential. And Chapter 5 noted the difficulties in general and for IFs specifically in forecasting changes in inequality. Thus, it is not surprising that IFs does not capture the potential effect of environmental change on the distribution of income. Because of the knife-edge property of the most common measure of poverty, \$1 per day, however, even small shifts in the distribution of income at the lower end could have a large influence on the total number of the poor.

Implications

We should not underestimate the challenge of delving into the potential implications of incorporating the environment more explicitly into analysis of future poverty levels. Michael Toman (2003: 15) notes that although a fair amount of empirical work has been done on the effects of human and economic activity on the environment, "less is known empirically about the effects of environmental quality on economic growth." Anthony J. McMichael and Rosalie E. Woodruff (2005) and Colin Butler (2005), respectively, chose the somewhat provocative titles "Detecting the Health Effects of Environmental Change: Scientific and Political Challenge" and "Peering into the Fog: Ecological Change, Human Affairs, and the Future" for contributions to the journal *EcoHealth*. Hence it is not a surprise that the design of integrated models such as IFs does not address issues of poverty and the environment at the level of detail, in terms of their representations of both the environment and society, required to capture the key relationships that make up the poverty-environment nexus.

Even still, it is possible to indicate the effect of taking more account of the environment in our projections. Most of the evidence points to the importance of addressing environmental issues as part of efforts to alleviate poverty. Environmental improvements, if shared

■ *Modeling and forecasting of poverty-environment relationships are not well developed.* ■

equitably, will enhance the earning potential of the poor. Alternatively, the poor are the most likely to suffer from environmental degradation. As such, efforts to increase economic development without proper consideration of the environment may lead to increased levels of poverty, even as average incomes rise.

As discussed throughout this section, IFs does not contain a particularly strong representation of the environment. Moreover, the environmental module is almost entirely a satellite of other modules, affected by them but not providing many inputs to them. The only indicators that may look explicitly at the state of the environment are the atmospheric concentrations of carbon dioxide (CO₂), land use (especially forest area), and remaining fossil fuel resources.¹⁶ Other indicators (mostly flows rather than stocks) do provide, however, some indication of pressures placed on the environment. These include energy demand, carbon emissions from energy use, water use, and livestock herds.

Table 9.2 looks at a few of these indicators in the IFs base case and the combined intervention scenario, which contains all domestic and international interventions to reduce poverty. As a primary means of reducing poverty, the combined intervention scenario involves considerably stronger economic growth in developing regions of the world than does the base case. It also involves, however, considerable technological advance in systems with the greatest effect on the environment (both in IFs and the real world), including agriculture and energy.

The relative impact that we should anticipate of the poverty-reducing scenario on the environment is therefore not immediately obvious. Table 9.2 shows it to be mixed. It increases energy demand considerably relative to the base case, especially in the developing world, so that relative oil and gas reserves are lower, while carbon emissions and atmospheric buildup of carbon are higher. But the scenario also relatively increases the use of renewables (not shown, but built into the scenario), so that the difference in environmental impact is not dramatic. Similarly, livestock herds increase substantially more in the developing world in the combined intervention scenario. Yet water use is not greatly different between the scenarios, and forest area is actually

somewhat larger in the combined intervention scenario. These results depend on a forecast of considerable improvement in agricultural productivity. In short, the combined intervention scenario is not significantly more environmentally friendly or damaging than the base case, giving us reason to believe that the failure of the model to include forward linkages from the environment affects both scenarios in much the same manner.

Overall, the significantly larger increases in energy demand and livestock herds in the combined intervention scenario also point to the potential for pro-poor policies to (inadvertently) increase pressures on the environment. Yet Table 3.1 includes a number of possible policy interventions that represent environmental sustainability as one strategic thrust in poverty reduction. The analysis in Chapter 7 was only able to incorporate greater attention to renewable energy. Other policies that IFs cannot explicitly represent, such as land reform, microfinance, and support for poor people's human capital, do address many of the social, political, and cultural factors at the center of the poverty-environment nexus. In this way, they can have impacts that go beyond simply raising average incomes. Thus Chapter 7 and the combined intervention scenario may well underestimate the positive effects of poverty reduction efforts on the environment.

Moving away from comparison, it is important to emphasize that, as currently configured,

● *Both base case and combined intervention scenarios would have great impacts on the environment, some negative and, via poverty reduction, some positive.* ●

Table 9.2 Selected environmental forecasts from IFs

Indicator	2000	2030		2055	
		Base case	Combined intervention	Base case	Combined intervention
World					
Atmospheric CO ₂ (ppm)	372.0	459.6	463.5	547.9	554.0
Carbon emissions from fossil fuels (billion tons)	6.88	12.05	12.50	9.15	8.50
Oil and gas reserves (billion barrels of oil equivalent, or BOE)	2,230	1,999	1,951	819	785
World Bank—Developing Economies					
Energy demand (billion BOE)	29.3	80.2	97.6	118.2	191.8
Water use (cubic kilometers)	2,919	4,355	4,465	5,143	5,340
Livestock herds (million tons)	205.4	531.2	597.1	778.9	941.8
Forest area (million hectares)	3,117	2,971	2,980	2,932	2,962

Source: IFs Version 5.47.

■ A poverty-conflict nexus also involves two-way relationships and links to a wider range of institutional variables. ■

both scenarios greatly increase the impact of global human activity on the environment by midcentury, including global carbon emissions from energy use, atmospheric concentrations of CO₂, energy and water demand, and livestock herd size.¹⁷ The table also shows declines in forest area in developing countries.¹⁸ Thus the failure of IFs to represent most of the potential impacts on poverty of these changes in either scenario is significant across all the analytic chapters of this book.

Given the limitations of our present understanding and analytical tools, it is not possible to state precisely what the net effect of more explicitly incorporating the environment would be on the analysis of future poverty levels presented in this volume. This is in line with the general message of much of the poverty and environment literature, which is that from the perspective of poverty reduction, the nature and quality of economic growth is as important as the quantity of that growth (Department for International Development 2002).

Conflict and Poverty

Can poverty reduction lead to a decrease in conflict (even including terrorism)? It is intuitive to think that relative economic prosperity will lead to less strife. What are the implications of success in conflict reduction for the evolution of poverty? What role might the external world have in helping reduce and control internal conflict? These are a few of the questions that motivate this section, in which we review the evidence on the connections between poverty and conflict.

We examine the conflict-poverty relationship for the same reason we examine the environment-poverty relationship, namely that the analysis with IFs largely omitted consideration of it. The IFs model contains a representation of domestic conflict potential across countries and time, using the potential for state failure (see LaFree, Dugan, and Fahey 2008) as the central variable. The model also represents the potential for international conflict, using a wide range of drivers (such as democratization level and economic openness) in the formulation. Since neither formulation is strong enough to form a basis for future projections, in our analysis neither internal nor international conflict affects economic growth

or other variables that shape poverty levels. We need to consider how important such an omission from the analysis might be.

Placing the discussion in an even more general context, the analysis of poverty futures in Chapters 5–8 did not capture unexpected events like the outbreak of conflict. Just as conflicts or plagues can derail even the gradual decreases in poverty resulting from slow and steady growth, growth miracles can bring about decreases in poverty far exceeding those seen during normal times (as in East Asia, China, and India). Therefore, understanding the implications of conflict on the poverty analysis conducted thus far is a useful exercise on robustness.

The World Bank (2005d: 7) provides a succinct summary of the interconnection between conflict and poverty:

Empirical evidence shows that poorer countries are more likely to experience violent conflict, while conflict-affected countries tend to experience higher levels of poverty. Violent conflict results in the destruction of economic and human capital. A country emerging from conflict is faced with damaged physical infrastructure, scarce employment opportunities, reduced foreign investment, and increased capital flight. ... The situation is worsened by weak governing institutions, which are often unable to implement policy and uphold the rule of law.

Viewed from the other direction, although poverty itself is neither a necessary nor a sufficient condition for conflict, poverty factors increase the likelihood of violent conflict in three main ways. First, a combination of poverty and unequal income levels makes it easier for many people, particularly young men, to be easily mobilized and recruited to armed groups. Second, weak and undemocratic governance structures, usually present in poor countries, are often incapable of preventing the onset of violence by peaceful means. Third, if a country with a large population is endowed with significant natural resources, rebel organizations are able to raise finances and galvanize public resentment against perceived or real injustices.

We therefore examine in greater detail how poverty can cause conflict and possibly

terrorism, how conflict can cause poverty, and how their mutual influence can result in economic stagnation with prolonged conflicts. Ideally, we want to identify options available for conflict-ridden countries and the external community to break this cycle.

The influence of poverty on conflict

Civil conflicts are much more widely prevalent than wars between countries (Hewitt, Wilkenfeld, and Gurr 2008). In sub-Saharan Africa alone, twenty-nine of forty-three countries suffered civil conflicts in the 1980s and 1990s (Sambanis 2001). Although such conflicts have multiple causes, Paul Collier et al. (2003: 53) note that civil war is concentrated heavily in the poorest countries and emphatically state, “The key root cause for conflict is the failure of economic development.” Doubling per capita income is associated with half the risk of rebellion, and an increase in growth by one percentage point is linked to a decrease of one percentage point in risk. Susan E. Rice, Corinne Graff, and Janet Lewis (2006: 5) echo this view.

For years, a debate has raged in academic circles over the principal causes of civil conflict. Is it ethnicity, grievance, rebel greed, topography or venal leadership? Today, an important element of this debate has been resolved: recent academic research on the causes of conflict demonstrates compellingly that countries with low income per capita are at increased risk of civil conflict. Recent statistical research on poverty and conflict suggests that for a country at the fiftieth percentile for income (like Iran today), the risk of experiencing civil conflict within five years is 7–11 percent; for countries at the tenth percentile (like Ghana or Uganda today), the risk rises to 15–18 percent.

According to Paul Collier and Anke Hoeffler (2004), a country with a gross domestic product (GDP) per capita of \$250 runs a 15 percent risk of experiencing a civil conflict; this risk drops to 7.5 percent with \$600 GDP per capita and 1 percent with \$5,000. Political causes and grievances do contribute to the complex phenomenon of conflict, but there is little

dispute over the finding that higher per capita income reduces the risk of conflict. Rice, Graff, and Lewis (2006: 7) provide a useful summary of relevant findings from the literature.¹⁹

Most studies use per capita income as an explanatory variable rather than direct poverty measures, but the evidence is quite suggestive of poverty giving rise to conflicts. As Collier and his colleagues (2003: 53) state: “Countries with low, stagnant, and unequally distributed per capita incomes that have remained dependent on primary commodities for their exports face dangerously high risks of prolonged conflict. In the absence of economic development neither good political institutions, nor ethnic and religious homogeneity, nor high military spending provide significant defenses against large-scale violence.”

In addition to the level of per capita GDP, the *growth rate* of GDP per capita also affects conflict. Collier and Hoeffler (2004) find that a 1 percent increase in the GDP growth rate reduces the risk of conflict by 1 percent. S. Brock Bloomberg, Gregory D. Hess, and Siddharth Thacker (2006) develop a simple theoretical model in which governments consider initiating diversionary conflict in order to increase their chances of staying in power. Societies with selfish leaders and lower gains from capital formation are more likely to be engaged in conflicts, lowering investment and growth.

Edward Miguel, Satyanath Satyanath, and Ernest Sergenti (2004) criticized the way in which the existing literature deals with issues of endogeneity (conflicts affect poverty, rather than the other way around) and omitted variable bias (government institution quality influences both economic outcomes and conflict, for example). To overcome these problems, they use the exogenous variation in rainfall (proportional change in rainfall from the previous year) as an instrument for economic growth in sub-Saharan African countries. Since these economies largely rely on rain-fed agriculture, rainfall is a plausible instrument.

Instead of the commonly used correlates of war conflict data, they use the armed conflict data from the International Peace Research Institute of Oslo and the Uppsala Conflict Database. They find these data to be more transparent in construction than correlates of war and also to include more small conflicts

● ***The correlation between conflict and poverty is indisputable.*** ●

● *Earlier analysis in this volume did not consider the conflict-reduction value of poverty-reduction initiatives.* ●

(a threshold of twenty-five battle deaths per year, in addition to the standard 1,000-death threshold). Using rainfall as an instrument, they find a strong connection between GDP growth and the incidence of civil wars:

A five-percentage-point drop in annual economic growth increases the likelihood of a civil conflict (at least 25 deaths per year) in the following year by over 12 percentage points—which amounts to an increase of more than one-half in the likelihood of civil war. Other variables that have gained prominence in the recent literature—per capita GDP level, democracy, ethnic diversity, and oil explorer status—do not display a similarly robust relationship with the incidence of civil wars in sub-Saharan Africa.... The impact of income shocks on civil conflict is not significantly different in richer, more democratic, more ethnically diverse, or more mountainous African countries or in countries with a range of different political institutional characteristics. (727)

They argue that their result is consistent with both channels typically attributed to how low income influences conflict: it reduces the opportunity cost of taking up arms as well as leads to a weak state with poor infrastructure that is unable to quell rebellions. They view these channels as complementary—weak states form the background in which poor individuals choose conflict over other economic activities.

What are the implications of these findings for our analysis? If there is a positive connection between poverty and conflict, a reduction in poverty can reduce the risk of conflicts. Since IFs does not capture the interconnection between poverty and conflict, we may be understating the benefits of reduced poverty. On the flip side, the concentration of poverty in sub-Saharan Africa, even as poverty in other regions of the world decreases, could increase the possibility of conflict and lead to sudden disruptions and setbacks that our analysis cannot fully capture, except perhaps through scenario analysis. What we know to be missing is explicit representation of the relationship in earlier forecasts.

● *Much more than poverty underlies conflict, and forecasting of conflict has proven very difficult.* ●

Nonpoverty determinants of conflicts

Complicating the analysis of poverty and conflict, the idea that economic variables such as GDP per capita or income are the primary determinants of conflicts has been contested. Even with respect to economic variables, it is important to emphasize that much more than GDP or income and its growth affect conflict. Among the other economic drivers of conflict are the availability of resources that elites can appropriate and fight over. For instance, if too little income can lead to conflict, so too can wealth in the form of natural resources. Collier and his colleagues (2003) note that natural resource endowments often correlate with conflict, poor governance, and economic decline.²⁰ Similarly, foreign aid accrues to the government, and a rebel group can access this resource by overthrowing the government. Therefore, economists (for example, Grossman 1992) have hypothesized that aid can be a source of conflict.²¹

Going beyond solely economic variables, the Political Instability Task Force has studied the causes of state failure and domestic conflict more generally since 1994 (Bates et al. 2006; LaFree, Dugan, and Fahey 2008). Among their early and often repeated findings are that democracy level and trade openness (exports and imports relative to GDP) correlate positively with state failure, while infant mortality relative to global averages correlates negatively. Note the absence of GDP or income in this set of findings.

Grievances of various kinds, including ethnic or religious fractionalization, also link to conflict (although poverty may give rise to the definition of such grievances).²² For instance, Milton Esman (1994) notes: “To argue, for example that the Israeli-Palestinian struggle is basically about economic values, or that the Quiet Revolution is mainly about employment opportunities for educated Quebecois, or that Malays are concerned primarily with closing the economic gap [with the Chinese in Malaysia] utterly trivializes and distorts the meaning and the stakes of these conflicts.”

What is the evidence for this alternate (“grievance” perspective) of conflicts? Alan B. Krueger and Jitka Maleckova (2003) go beyond description to systematically examine a variety of evidence connecting education, poverty and a particular type of conflict, namely terrorism.

They undertake an analysis that reaches out to the literature on the economics of crime, that looks to survey research of Palestinians, that explores Hezbollah in Lebanon in some detail, and that draws on cross-country evidence across a number of international terrorist events. They conclude: “Any connection between poverty, education and terrorism is indirect, complicated and probably quite weak. Instead of viewing terrorism as a direct response to low market opportunities or ignorance, we suggest it is more accurately viewed as a response to political conditions and long-standing feelings of indignity and frustration that have little to do with economics” (119).

These findings resonate with Jonathan Goodhand’s (2001) claim that it is more likely the transiently poor, rather than the chronically poor, who rebel, since the latter group is likely to be the least organized. Relative rather than absolute poverty is likely to be more critical in conflict-inducing grievance. He notes that in Central Asia, the disgruntled middle class, whose expectations have been dashed by the stagnant economy, join the Islamist cause most actively.

How can the above evidence be reconciled with the earlier evidence on poverty and civil conflict? The most plausible explanation is that terrorism is quite different in nature from civil conflicts and is much more likely to be driven by political rather than economic considerations. As Krueger and Maleckova note, terrorism has arisen in countries not embroiled in civil war, and countries undergoing civil war have not always been a breeding ground for terrorism (though they consider the connection between national poverty and terrorism a useful research area for the future).

From the point of view of our analysis, reductions in poverty that occur in our simulations do not necessarily imply a drop in terrorism or any other kind of conflict. Thus again our analysis may underestimate the overall benefits of incremental poverty reduction, because such reduction could reduce conflict, enhance growth, and create a positive feedback loop that furthers poverty reduction. The next subsection explores this closing of the analysis loop.

The influence of conflict on poverty

There is extensive evidence on conflict increasing poverty. As Collier and his colleagues

(2003) succinctly note: “War reverses development.” It causes displacement of people; decreases in per capita income, growth, and food production; and an increase in disability and disease, which affects even more people than those killed in the conflict.

Stark, specific examples for precipitous declines in income due to conflicts are readily available—for instance, Rice, Graff, and Lewis (2006) note that Côte d’Ivoire’s per capita income dropped from \$1,120 in 1980 to \$650 in 2000. Collier (1999) finds that during civil war, countries grow around 2.2 percentage points more slowly than during peace. Based on an average civil war duration of seven years, he calculates that incomes would be lower by 15 percent and absolute poverty would be higher by 30 percent. This is in line with the World Bank estimate that conflict in Africa is causing a loss of 2 percent annual economic growth (Department for International Development 2001). Stewart C. Huang, and M. Wang (2001) find that in fourteen countries affected by civil war, the average annual growth rate was –3.3 percent. For most of these countries, per capita income fell, food production declined, external debt increased, and export growth decreased.

Goodhand (2001) surveys the research on poverty and conflicts and concludes, “Chronic internal wars are likely to produce chronic poverty.” He notes that chronic poverty is likely to increase due to the higher dependency ratios caused by an increased proportion of the old, disabled, and women in the population left after the conflict.

What are some of the other paths that link conflict to loss of economic growth, increased poverty, and adverse social consequences? During civil conflicts, developing countries spend more on the military—5 percent of GDP—instead of the 2.8 percent of GDP during normal times (Collier et al. 2003). Increased military spending decreases expenditures on infrastructure and health, which has negative consequences for incomes and social indicators. On the income front, according to the simulations in Malcolm Knight, Norman Loayza, and Delano Villanueva (1996), the extra 2.2 percent of GDP spent on the military over the seven years of a typical conflict would result in a permanent loss of 2 percent of GDP. On the health front, Anke Hoeffler and

● **Conflict greatly complicates the reduction of poverty.** ●

Marta Reynal-Querol (2003) find that during a five-year war, infant mortality increases by 13 percent, and in the first five years of peace after conflict, the mortality rate remains 11 percent higher than the baseline. Civil wars also increase the incidence of malaria and its transmission across borders. The negative health effects of conflicts result both from the increased exposure of the civilian population to the risk of disease, injury, and death and because the government devotes less of its budget to public health.

Conflicts also result in the flight of already scarce capital. A typical country in civil war held 9 percent of its private wealth abroad prior to the war. By the end of the war that had risen to 20 percent, signifying a flight of more of than a tenth of the private capital stock (Collier et al. 2003). Civil war also leads to a deterioration of political institutions. A typical low-income country neither at war nor in postwar peace has a Polity IV index of 2.11 (on a ten-point democracy scale, higher indicating greater democracy), whereas countries in the first decade of postwar peace average only 1.49.²³

In summary, conflicts increase poverty, whether narrowly construed (income) or broadly construed (disease, mortality, deterioration of freedom). Since IFs does not capture these interactions, it is possible that sudden conflagrations could derail the march toward a global reduction in poverty reported in our simulations.

What might the possibility for loss in the fight against poverty be in sub-Saharan Africa if greater conflict wracked the continent in the future? Chapter 5 provided a basis for thinking about that. It documented (see Table 5.2) that the economic forecasts for Africa in the IFs base case at PPP are 0.7 percent higher through 2030 than those of a recent *Global Economic Prospects* (World Bank 2007).²⁴ This economic growth differential is a very large portion of the explanation for the difference in extreme poverty forecasts between the IFs base case and the World Bank (see Table 5.3). Although the IFs base case estimates with its lognormal formulation that 29.4 percent of sub-Saharan Africa will live in extreme poverty in 2015, the World Bank estimates that it will be 31.4 percent. The discussion in this section suggests that lower conflict rates could easily generate

a gain of 0.7 percent in economic growth for the continent (as higher ones could lead to economic loss).

The conflict trap

Given the evidence on poverty causing conflict and conflict causing poverty, it is natural to conjecture that the mutual feedback could cause a “conflict trap”—a stagnant situation in which civil war dramatically slows down a country’s development, and the failure of development creates a greater risk of conflicts.

Indeed, many researchers emphasize this mutual feedback. Frances Stewart and V. Fitzgerald (2001: 4) note: “The very high incidence of wars among low-income countries almost certainly reflects a two-way causality with low income predisposing to conflict and itself being a probable outcome of conflict.” Ted Robert Gurr, Monty G. Marshall, and Deepa Khosla (2001: 13) state: “Poor societies are at risk of falling into no-exit cycles of conflict in which ineffective governance, societal welfare, humanitarian crises, and the lack of development perpetually chase one another.”

There is little evidence, however, for a true conflict-trap equilibrium.²⁵ Countries do escape conflict periodically, only to fall back into it. Collier and his colleagues (2003), for instance, note that a conflict further increases the risk of long-term conflict by about 17 percent. Fluctuations between conflict-free and conflict-ridden periods could well be a long-run equilibrium.

What can be done externally?

Policies to reduce the risk of conflict follow naturally from the leading causes—reducing poverty, increasing growth, reducing dependence on natural resources and primary commodities, and reducing corruption and improving governance in general. Since our focus is on poverty rather than conflict per se, we will survey suggested policies only briefly, with the aim of identifying implications for our analysis.

Improving governance is a common (perhaps the most common) contemporary prescription for reducing conflict as well as reducing poverty. (The next section will, in fact, turn to governance and poverty specifically.) Collier and his colleagues (2003) note, for example, that in 1970 both Botswana and Sierra Leone

● **The feedbacks between poverty and conflict may create a conflict trap.** ●

were low-income countries with substantial diamond resources. Diamonds fueled the economic growth of Botswana, but they brought about the downfall of Sierra Leone. Democracy and stability and development of a national plan with clearly targeted public expenditures greatly aided Botswana's cause. That example often bolsters the call for improved governance. The diagnosis underlying the prescription may, however, be simplistic.

The story is more complex. The diamonds in Botswana are concentrated and subject to government control, while those in Sierra Leone are alluvial and difficult for the government to control. In conjunction with fiscal mismanagement and corruption, these conditions set the stage for organized criminals to take over diamond mining. There are many other elements that may underlie improved government capacity and reduced conflict. Botswana benefited, for example, from an unusually cohesive ethnic structure (the Tswana make up nearly 80 percent of the population), whereas ethnicity and religion are more divisive in Sierra Leone. The lesson is that the interaction among governance, natural resources, and conflict is nuanced.

A number of possible activities, many of them with assistance from the international community, can support the emergence of stronger government and less conflict:

- International initiatives such as "publish what you pay." All payments made by multinational corporations, especially those involved in resource extraction, should be made public. This information would aid transparency and assist citizens of resource-rich countries in holding their governments accountable for revenues and their use and distribution.
- International assistance in controlling theft of local commodities that encourages domestic conflict over them. The Kimberley process, initiated in 2002 to eliminate conflict diamonds from shipments of rough diamonds, is an example of such an intervention.
- Further progress in preventing economic shocks from destroying governance capacity. Commodity price crashes often occur without reserve funds in place; natural disasters such

as hurricanes often strike without internal capacity for response or external assistance (although international insurance schemes for natural disasters are improving).

- Timing foreign aid so as to help governments rebound from conflict. Collier and his colleagues (2003) criticize the tendency of donor countries to concentrate aid immediately after a conflict ends and then to decrease flows rapidly. They recommend both larger flows and a more gradual tapering off.
- Use of foreign assistance processes to widen participation in governance and to analyze and target conflict reduction. The World Bank's (2005d) own retrospective analysis of poverty reduction strategies in nine conflict-affected countries concluded that much more could be done along these lines.

The implications of having omitted conflict from the analysis

We have already noted the risk of omitting an explicit treatment of conflict from our analysis: it can lead to more optimistic growth rates in the base case for Africa and therefore more optimistic projections of poverty reduction. At the same time, however, omission of conflict from the analysis means that the opportunity for reducing conflict and thereby accelerating poverty reduction may also be underestimated. In sum, although the base case may risk overestimating poverty reduction, the combined intervention scenario, in particular, may err on the side of underestimating leverage for reducing poverty.

Governance and Poverty

The discussion of conflict and poverty touched upon the relationship between governance and poverty. This section considers that relationship in greater detail. In contrast to the significant omission of conflict from the volume's earlier analysis, and to the very limited treatment of environmental issues in that analysis, governance discussions have been fairly extensive. Yet the topic is important enough to ask, (1) Have the inevitable weaknesses in the empirical analysis led us to any systematic misrepresentations in the projections? and (2) What improvements might be undertaken in future analyses?

This volume has paid substantial attention to the interaction between governance and

■ *External initiatives can help break the vicious cycle of conflict and poverty.* ■

■ *Omission of poverty-conflict linkages means that the combined intervention scenario may underestimate poverty reduction potential.* ■

■ Earlier analysis treated governance improvement as costless, a questionable assumption. ■

■ Poverty and corruption feed each other through various channels. ■

poverty reduction. Inspired by the World Bank project on governance, in Chapter 7 we explored interventions based on improvements in economic freedom, governance effectiveness, and government corruption, which are part of the “domestic self-help” strategy. Table 7.3 presented the effects of the individual levers on poverty reduction. Chapter 8 explored further the linkages between many dimensions of governance and poverty reduction in specific continents and countries.

The IFs model also captures linkages from poverty reduction to improved governance, based on the strong empirical relationship between the two. Yet, Chapter 7 noted that the analysis does not capture the cost of improvements in governance. Indeed, most of the development literature is silent on the costs of institutional change. Given this, the results in Chapter 7 pertaining to governance are best viewed as “scenario planning” exercises rather than an analysis of poverty reduction based on cost-benefit trade-offs.

More generally, this volume has not considered factors other than economic growth that may bring about better governance. There is much consideration in the global community of how external actors might assist domestic efforts, for instance by tying foreign assistance to governance improvements. No such efforts or linkages affected our analysis, including the intervention that increased aid to at least 0.5 percent of GDP for donor countries.

IFs captures some of the economic effects of aid (such as the Dutch disease), but not the effects of sociopolitical forces (such as diversion of funds). Nor does IFs represent how governance and aid interact (recent research shows differential effects of aid based on the quality of governance and institutions). In particular, can aid be structured so as to improve governance and decrease corruption? Discussing these issues here is clearly in the spirit of checking the robustness of our earlier analysis, especially because the intervention of higher foreign aid outperforms other interventions in reducing the poverty headcount.

Although government efficiency and even specific government policies are arguably as important as corruption, corruption is at the heart of contemporary analysis of governance because it fundamentally affects efficiency and

policy choice. We focus on it here. We survey the literature on the linkage of corruption to poverty and of poverty to corruption only briefly. We then turn to a discussion of external levers to improve governance, the linkages missing from our earlier analysis. Clearly, this discussion complements the one in the previous section, since improvement in governance is also critical for conflict reduction.

Corruption causes poverty

Eric Chetwynd and colleagues (2003) note that existing research examines an indirect relationship between corruption and poverty. “Corruption, by itself, does not produce poverty. Rather, *corruption has direct consequences on economic and governance factors, intermediaries that in turn produce poverty*” (6, italics in original). They distinguish between an “economic model,” in which corruption affects poverty via economic factors (reduced investment, distorted markets, and increased inefficiency of doing business) and a “governance model,” in which corruption affects poverty via governance factors (decreased institutional capacity to deliver quality public services, increased spending on capital projects more conducive to corruption, and decreased compliance with safety and health regulations).

The economic channel of corruption affects two proximate drivers of poverty—growth and inequality. Several World Bank surveys on corruption have found that corruption hinders economic growth by scuttling the expansion plans of businesses (thereby diminishing domestic investment), hurting entrepreneurship (since small business pay a disproportionate share of their revenues as bribes), and causing evasion of taxes and fees by bribing the appropriate authorities.²⁶ Even after controlling for the state of economic development, Sanjeev Gupta, Hamid Davoodi, and Rosa Alonso-Terme (2002) find that higher corruption increases inequality of income as well as factor ownership. It also increases inequality by effectively decreasing the progressivity of taxes.

Turning to the governance model, Michael Johnston (2000) studied eighty-three countries and found political competition is correlated with lower corruption (after controlling for GDP), suggesting corruption threatens

governance through weaker political institutions and reduced mass participation. Paolo Mauro (2002) finds evidence that corruption affects governance by altering the composition of government spending—corrupt governments spend less on education and health.

The IFs-based analysis in Chapter 7 (see the chapter appendix) accounts, at least partially, for the economic channels discussed above when it considers interventions to reduce corruption (for instance, the 60 percent reduction in the corruption perceptions index over twenty years for Middle Africa and Eastern Europe, and 50 percent for Western Africa). Inasmuch as IFs does not capture other economic and governance channels, however, the analysis could well understate the effect of these interventions on poverty. However, simultaneously ignoring the cost of reducing corruption, which could divert government spending from other priority areas, might overstate the effect of these interventions on poverty, somewhat offsetting the omission.

Poverty causes corruption

Although evidence for corruption causing poverty (i.e., lower income) is widely available in the literature, the evidence for reverse causality is much rarer. Jeffrey Sachs (2005: 312) states: “As a country’s income rises, governance improves for two major reasons. First, a more literate and affluent society is better able to keep the government honest by playing a watchdog role over government processes. ... Second, a more affluent society can afford to invest in high-quality governance.”

Daniel Treisman (2000) lists additional channels by which development might lower corruption. He notes that economic development draws a clearer line between the public and the private. In traditional societies this distinction is fuzzy and bribery gets confused for tributes, lowering the social stigma of corruption. He uses econometric methods to search for evidence on income affecting governance in general and corruption in particular. The effect is strong: “A tenfold increase in 1990 per capita GDP—say from that of El Salvador to that of Canada—would lead to a drop in the corruption rating of between 4.16 and 4.76 points—which would bring El Salvador up to somewhere around Hong Kong or Ireland. ... Log per capita GDP can by itself explain at least 73 percent of the variation in

each of the 1990 TI [Transparency International] perceived corruption indexes” (430).²⁷

The earlier analysis did build on a representation by IFs of the ability of economic growth and corruption to influence each other. The analytical weakness, however, has been in not relating a variety of other interventions to the reduction of corruption. These include the efforts of external actors, to which we turn next.

External involvement and governance

The general debate about whether foreign aid helps recipient countries economically overlaps with the debate about the role of external involvement in influencing governance of recipients. Craig Burnside and David Dollar (2000) conclude that aid positively affects growth for developing countries that have sound fiscal, monetary, and trade policies. Their study has also been influential in providing *criteria* for targeting aid. However, William Easterly (2003) argues that the Burnside-Dollar conclusions are not robust across alternative definitions of aid, policies, and growth. Raghuram G. Rajan and Arvind Subramanian (2005) find that even after correcting for the possible bias that poorer (or stronger) growth might affect aid inflow, there is little robust relationship between aid and growth.

The somewhat narrower debate of interest to us here is whether foreign assistance can be *used* as a lever to reform corrupt countries, or more pessimistically, whether aid causes corruption in the first place. Paul Collier and David Dollar (2001) identify two opposing effects of aid on corruption. If aid is linked to government actions to reduce corruption, there will be a direct, favorable effect. However, aid could exert a negative effect by adding to the government’s resources, thereby reducing the need for meeting expenditures through taxation and with it the domestic pressure for accountability.

The empirical debate on this question, too, continues to rage. Stephen Knack (2000) found that in the 1982–1995 timeframe aid actually increased corruption and decreased bureaucratic quality and the rule of law. Alberto Alesina and David Dollar (2000) look at more than a hundred cases of “surges” in finance but find that only in a handful of cases does policy really improve in the following three to five years, and in as many cases policy significantly worsens. Alberto Alesina and Beatrice Weder (2002) use

■ *The potential of foreign assistance to reduce corruption is controversial.* ■

time series data on corruption and find that an increase in aid is associated with an increase in corruption. (See also Jakob Svensson 2000 on ethnically fragmented countries.)

Given such negative findings, it is not surprising that recent debate on aid has also focused on the issue of *conditionality*—should aid be given based on promises of good policy to follow? Collier and Dollar (2001) note that such ex-ante conditionality does not work since promises are seldom kept in practice. Burnside and Dollar (2000) also argue for ex-post rather than ex-ante conditionality.

Are donors targeting recipients based on their governance in practice? Alesina and Weder (2002) examined a cross-section of countries in the 1975–1994 time period and found that, after controlling for other potential determinants of foreign aid (such as income, size, economic policies, political system, and historical links with donors), there is no evidence that bilateral or multilateral aid goes disproportionately to less corrupt governments. The Scandinavian countries and Australia, however, which do not have any colonial links, appear to have greater flexibility in the countries they choose to provide aid to, and give more to less corrupt countries.

There is contrary evidence when studies conceptualize governance more broadly. Eric Neumayer (2003) examines all aspects of governance and finds that democracy, human rights, and regulatory burden, in addition to corruption, influence donors' decisions at the eligibility stage. Human rights and regulatory burden also influence the actual aid flows. Even the Alesina and Dollar (2000) study mentioned earlier finds that developing countries that support civil liberties and political freedom receive more aid. Kamiljon Akramov (2006) finds that lower governance quality reduces the likelihood of receiving foreign aid.

In summary, the available evidence seems to indicate a tendency among donors to select recipients for foreign aid and choose the amount of aid to selected countries based on governance, broadly construed, though not necessarily based on corruption alone. There is also substantial heterogeneity in such targeting across donor countries.

Donor countries also attempt to use levers other than foreign aid on behalf of better governance. They have tied debt cancellation

for heavily indebted poor countries (HIPC) to the preparation and implementation of a Poverty Reduction Strategy Paper (PRSP). PRSP preparation and implementation are linked to three principles relevant to corruption prevention: (1) participation of social actors capable of monitoring, criticizing, or sanctioning the actions of the government and other public institutions; (2) an increase in the transparency of government actions; and (3) accountability by way of a clear definition of which public institutions are responsible for which political measures.

Walter Eberlei and Bettina Fuhrmann (2004) study PRSPs from fifty-four countries and conduct an in-depth analysis of five country case studies. Only nine out of the fifty-four countries studied dealt with corruption in detail in their PRSPs, and even those display weaknesses in the quality of their analysis or formulation of strategies to combat corruption and poverty. Yet the study concludes there is little doubt that the PRSP approach can be effective in the fight against corruption.

Implications for our analysis

Based on the evidence presented in this section, one would have to conclude that the connections among aid, development, and governance are complex; few concrete findings emerge. Although there is evidence that aid increases corruption, there is also evidence that some countries target aid based on governance. The coming years will no doubt see much more research on this important topic. Meanwhile, our approach of treating aid and governance separately in the context of poverty reduction, and not representing any direct relationship between aid and quality of governance, appears consistent with the current state of research findings.

Conclusion

From the outset, this study has attempted to recognize its limitations. This chapter acknowledged inadequacies in our treatment of several key variables or systems and their influence on poverty. In particular, the chapter singled out environmental systems, conflict, and governance, and it looked at possible relationships between external action and all of these. (Were more time and space available, it could also have added attention to infrastructure

■ Any model for forecasting poverty reduction will unfortunately omit or incorrectly specify much of importance. ■

and science and technology.) Even though our treatment of these topics has been inadequate, a review of the literatures indicates that great theoretical and empirical uncertainties remain about how they relate to poverty. In some cases it appears that omissions in our study have caused us potentially to overestimate prospects for poverty reduction, and in other cases to underestimate those prospects; in

many instances, the direction of impact from omissions is simply not clear.

This analysis is not an attempt to absolve analyses of poverty, including this one, of the responsibility of delving more deeply into this broader set of relationships. Future studies, inside and outside this project, must continue to do so.

- 1 Available at http://www.povertyenvironment.net/pep/filestore2/download/193/pep_policy_dialogue_report_final_28-11.pdf.
- 2 Available at [http://www.unep.org/Documents.Multilingual/Default.asp?ArticleID=5514&DocumentID=499&l=en](http://www.unep.org/Documents/Multilingual/Default.asp?ArticleID=5514&DocumentID=499&l=en).
- 3 See, for example, UNEP GC21/15, GC22/10, and GC23/10.
- 4 A UN Development Programme (UNDP)–European Commission (EC) initiative of the same name (see UNDP/EC 1999a, 1999b) preceded this partnership.
- 5 See <http://www.undp.org/pei> and <http://www.povertyenvironment.net/pep>.
- 6 Among the first efforts in this vein after from the report of the WCED were those by Leonard (1989), Durning (1989), and Gallopin, Gutman, and Maletta (1989) Duraipapp (1996), Forsyth, Leach, and Scoones (1998), Scherr (2000), and the Poverty-Environment Partnership (2005). These studies provide overviews of the relationships between poverty and the environment. Specific empirical work includes that of Agarwal (1997), Barbier (2000), Carter et al. (2007), Cavendish (1999a and 1999b), Dasgupta et al. (2005), Lufumpa (2005), Narain, Gupta, and Klaas van 't Veld (2005), Scott (2006), and Swinton, Escobar, and Reardon (2003). The relationships between the environment and human well-being have also been central to recent international environmental assessments, including the Millennium Ecosystem Assessment (2003; 2005), and the fourth Global Environment Outlook (United Nations Environment Programme 2007), as well as recent World Resources Institute reports (2000; 2005).
- 7 Dramatic examples of the importance of these factors are seen in the cases of what are referred to as “resource curses” discussed elsewhere in this chapter and volume.
- 8 See Duraipapp 1998; Arnold and Bird 1999; Parikh 2002; Jahan and Umana 2003; Nayak 2004; Dasgupta et al. 2005; Lufumpa 2005; Poverty-Environment Partnership 2005a; ADB 2007. A short-lived newsletter aimed at enhancing the poverty-environment dialogue was, in fact, simply titled *Nexus* (<http://www.iisd.org/publications/pub.aspx?id=454>).
- 9 It is interesting that Duraipapp (1998) does not also draw direct links from power, wealth, and greed, institutional failure, and market failure directly to poverty, especially because he is careful to distinguish between environmentally induced and nonenvironmentally induced poverty.
- 10 See for example Duraipapp (1996; 1998; 2004), Forsyth, Leach, and Scoones (1998), and Gangadharan and Valenzuela (2001).
- 11 See Bass et al. (2006), Narain, Gupta, and van 't Veld (2005), Poverty-Environment Partnership (2005), World Bank (2005), and WRI (2005). WRI, in fact, refers to the environment as the “wealth of the poor.”
- 12 The third volume of this series will address links between health and the environment more thoroughly. Here we focus on its potential impact on economic productivity.
- 13 See http://www.who.int/quantifying_ehimpacts/en and <http://www.who.int/heli/en>.
- 14 See Toman (2003) for a similar approach to that described here.
- 15 The physical values from the partial equilibrium modules for agriculture and energy, multiplied by initial prices and relative price change over time, enter the broader economic module in value terms and override the simpler production function calculation of the economic module.
- 16 IFs calculates a measure of mean world temperature from the carbon dioxide levels, but the function is very basic; the model looks to elaborate climate models for leadership on such forecasts.
- 17 The table hides the fact that emissions peak around 2030 in both scenarios before leveling off and beginning a gradual decline. Because of the cumulative and delayed nature of the impact of emissions on the global climate, though, the atmospheric concentrations and world temperature continue to rise throughout the scenario period.
- 18 By the end of the scenario period, these declines have leveled off in the combined scenario and are close to leveling off in the base case.
- 19 Looking at a one-year horizon, Fearon and Laitin (2003) find that at a \$579 per capita GDP level, there is a 17.7 percent risk of conflict, at \$2,043, a 10.7 percent risk, and at \$9,466, less than 1 percent risk. Sambanis (2003) finds that the average GDP per capita for countries that experienced war within five years is \$2,176; for those that did not experience war within five years, it is \$5,173.
- 20 They find that the relationship between exports of primary commodities as a fraction of GDP and conflict is nonlinear and peaks with 30 percent resource dependency.
- 21 Collier and Hoeffler (2002) do not find, however, that aid increases the risk of rebellion. Aid could affect conflict through growth but does not appear to have a direct effect.
- 22 Although ethnic fractionalization has been often cited as a reason for conflicts, Collier and Hoeffler (2002) suggest that limited ethnic differentiation can actually be a problem—if the largest ethnic group is an absolute majority, the risk of rebellion increases by 50 percent. In such societies, the minorities might fear exclusion from influence despite a democratic political process. Ethnic differentiation could be of greater importance if a country discovers natural resources such as oil, since resources are usually geographically concentrated, and the issue arises of whether the locality or the nation as a whole owns it.
- 23 The comparable numbers are 4.79 and 5.66 on the seven-point Freedom House scale of political freedoms, on which higher numbers are less free (Collier et al. 2003).
- 24 The growth rate assumption differential results directly from the use in IFs of higher African growth rates based on the late 1990s to estimate future growth. The higher growth rate in IFs thus in part reflects lower conflict in the last half of the 1990s.
- 25 Although we are not aware of studies that explicitly seek to test for the existence of *conflict* traps, there are a few that test for the existence of income or poverty traps (McKenzie and Woodruff 2002, Kraay and Raddatz 2005, and Caucutt and Kumar 2006). All these studies conclude that there is scant evidence for the existence of poverty traps as described above.
- 26 Mauro (1995, 2002) finds in a cross-country sample that a high level of corruption is associated with a lower level of investment as a share of GDP and lower growth of per capita GDP. In another cross-country study, Tanzi and Davodi (1997) find that higher corruption increases (low-productivity) public investment, reduces government revenues, lowers expenditures on operations and maintenance, and reduces the quality of public infrastructure, all of which lower growth. Kauffmann et al (1999) find a strong positive causal connection between governance and per capita income.
- 27 To shed light on causality, Treisman uses the distance from the equator as an instrumental variable for economic development. Previous research (for instance, Sachs 1997) has suggested that tropical countries grew slower than temperate countries. The correlation between these two variables is high (0.69 for 1990 per capita GDP), and the distance from the equator is unlikely to directly affect corruption other than through economic development, which makes it a useful instrument.