

**Poverty and Environment:
Background Paper for the World Bank Environment
Strategy**

**Julia Bucknall, Christiane Kraus, and Poonam Pillai
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Summary

Traditionally, the Bank's environmental activities have focused on achieving environmental benefits, with no particular focus on reducing poverty. We have assumed that these environmental benefits generate benefits to society as a whole, and we have not typically aimed to maximize benefits to the poor. Given the Bank's overall mandate of fighting poverty, some people argue that the environmental work should concentrate on interventions that aim specifically to benefit the poor.

This paper outlines what a poverty-focused environmental strategy might look like and analyzes some of the implications for the environmental community of the Bank. It draws on the *2000/2001 World Development Report* framework for understanding poverty in terms of opportunity, empowerment, security, and capability, and it examines how environmental factors can contribute to each of these dimensions. For instance, opportunity declines when poor people who depend on natural resources for their livelihoods can no longer support themselves because the environmental resources degrade and they lack alternative livelihood opportunities. Capability is impaired when poor people's health is damaged by dirty water or air or by diseases related to the environment (such as malaria). Security is threatened by natural disasters and climatic variation, particularly for the poor, who tend to be physically more vulnerable to natural disasters and to have fewer resources to cope with them.

The paper examines what kinds of indicators best capture the relationship between different dimensions of poverty and the environment, both in terms of its productive capacity (natural resource base) and in terms of its absorptive or "sink" capacity. For the environment sector, a focus on poverty reduction would involve choosing one or two indicators and assigning priority to activities that are likely to have the greatest impact on poverty. A focus on poverty outcomes in particular countries or areas would result in several high-priority environmental activities. Some of these would be stand-alone activities, but most would involve working cross-sectorally—for instance, working with rural sectors on land productivity or with health sectors on malaria reduction.

The paper also analyzes the environmental portfolio in Brazil, Indonesia, and Zambia to see the extent to which the current portfolio attempts to reach the poor, and which types of projects would be emphasized if the Bank adopts the proposed approach. This analysis shows that the benefits from approximately one-third of the projects would primarily reach the non-poor. No particular type of environment project seems to be systematically pro-poor. We conclude that a poverty-focused environment strategy would require a change in the design of operations more than the sectoral composition of the portfolio. Operations in areas with large poor populations or those that make specific efforts to reach the poor would clearly be preferred. It is possible to envision pro-poor projects of every type, although industrial pollution projects, general environmental strengthening projects, and some biodiversity projects may fall in priority relative to water supply, basic sanitation, disaster protection, natural resource management, and vector-borne disease

reduction projects. The fundamental change would be one of approach: picking a key poverty-related indicator, choosing the most effective type of intervention, and quantifying its effects on that indicator.

With the publication of its mission statement regarding “fighting poverty with passion and professionalism for lasting results,” the World Bank has sharpened its focus on poverty reduction. Increasingly, country strategies are focusing specifically on poverty reduction outcomes and are requiring the sectors to work together to achieve those outcomes. This marks a significant departure from previous ways of operating. Until recently, the implicit strategy for environmental activities within any particular country or region was based on achieving the most environmental benefit for a unit of expenditure (based often on priorities highlighted in National Environmental Action Plans). Environmental benefits are supposed to benefit society as a whole, so the aim has implicitly been to maximize societal benefits. The Bank seldom designed projects specifically to benefit the poor disproportionately. In the same way, other sectors pursued their own objectives, often aiming for the greatest social benefits or economic growth and not specifically to reduce poverty.

In this paper, we examine how environmental activities can contribute to poverty reduction. We assess the implications for the environment sector of moving toward a poverty-based strategy—that is, of getting the most poverty reduction for each unit of expenditure—and then consider the kinds of environmental activities that are likely to be given priority from such a shift. It is important to note that a focus on poverty does not imply moving away from activities that promote macroeconomic stability or growth. On the contrary, growth is fundamental to reducing poverty. This approach simply requires our activities to aim for growth that is explicitly seen as a means of poverty reduction rather than as an end in itself.

Although the paper was written as a contribution to the environmental strategy of the Bank, it has broader implications on how donor institutions can facilitate sustainable livelihoods and poverty alleviation through environmental activities. Our goal, however, is limited in that we aim to highlight tricky issues, raise questions, and provoke discussion rather than to present a polished position.

The paper begins by defining what we mean by poverty and environment. Section 1 discusses the analytic framework used to examine environment/poverty links. Section 2 takes a closer look at linkages between environment and income/opportunity (here considered primarily in terms of the poor people’s relationship to the natural resource base), health, security, and empowerment. Section 3 analyzes the World Bank’s environment portfolio according to its “poverty focus” and draws preliminary conclusions about whether certain types of projects tend to be pro-poor. Section 4 highlights the types of projects that a poverty-focused environmental strategy might favor. Section 5 is the conclusion.

1 Understanding the Concepts

1.1 How Do We Characterize Poverty?

Economists have traditionally defined poverty on the basis of a household's income or consumption, taking this as the best proxy for welfare. Using this approach, people are considered poor if their consumption falls below a given poverty line. This can either be relative—say, a line set at 50 percent of average consumption for the country or region—or it can be absolute, based on a set basket of food and basic goods and services. Poverty analysis has traditionally aimed to understand the determinants of income poverty.

Now, however, the definitions are moving beyond this single dimension to include utility- and capability-based concepts. This includes inequality (both within a country or region and within a household), health, education, security, political voice, and discrimination (see, for example, Sen 1981, Putnam, Leonardi, and Nanetti 1993). All of these measures are not necessarily at work in every context, but generally each is needed to capture something missing in the others (Ravallion 1996). Poverty analysis is therefore now broadening to encompass an understanding of the determinants of these other dimensions (such as factors that lead to poor child nutrition outcomes). It is clearly more difficult to find a single measure for this multidimensional analysis, and most studies take each dimension separately.¹

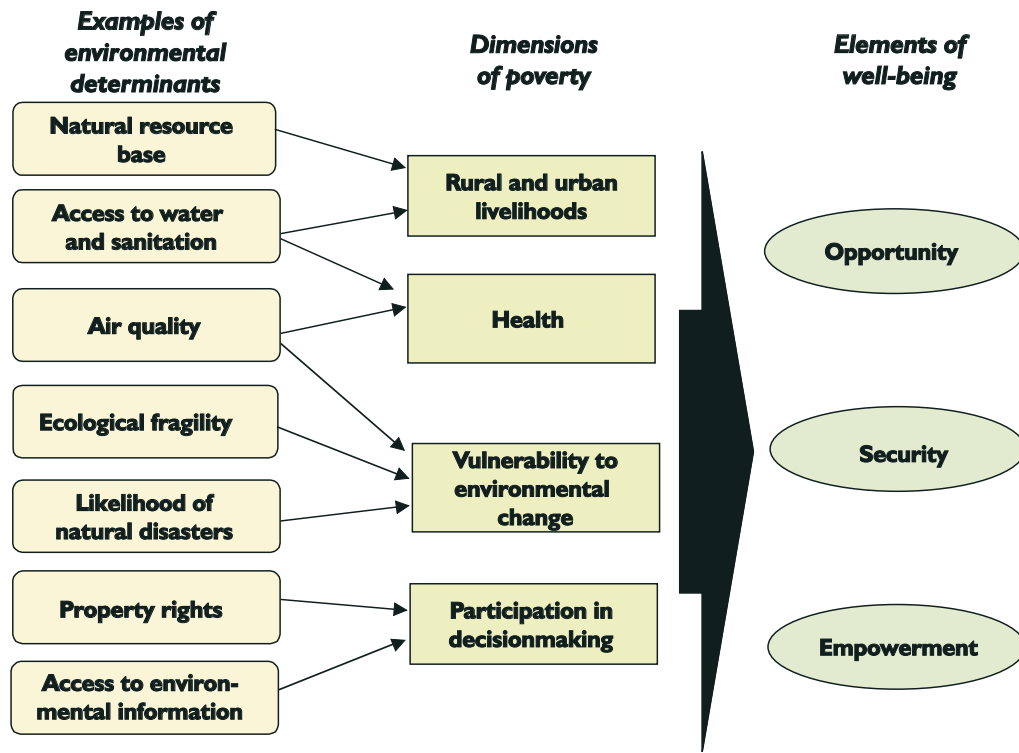
Various studies have attempted to group these dimensions of poverty. One approach takes a fivefold “asset vulnerability framework,” which considers labor, human capital (health and education), household assets (such as housing), household relations (mechanisms for pooling income and sharing consumption within the household), and social capital (potential for reciprocity within communities and between households) (Moser 1998). Other authors mention “geographic capital” to capture the evidence that certain geographic areas are persistently poor (Ravallion 1996).

The *2000/2001 World Development Report* groups the different dimensions of poverty as opportunity, empowerment, and security. Much recent work in the Bank follows this approach, but includes capabilities (or human capital) as a separate category.² Figure 1 shows how different factors or determinants can influence different dimensions of poverty, affecting people's opportunity, capability, security, and empowerment in many different ways. In this paper, we have chosen the relationships indicated by the arrows in the Figure just as examples of how these categories might relate to each other.

¹ Bourguignon and Chakravarty (1998) attempt to find a composite measure taking account elasticities of substitution between different dimensions of poverty. In general, however, analysts take each dimension separately.

² The *World Development Report* includes capabilities within opportunity.

Figure 1. Schematic Representation of Dimensions of Poverty



1.2 What Do We Mean by Environment?

“Environment” generally means a natural resource base that provides sources (material, energy, and so on) and performs sink functions (such as absorbing pollution). The term can include resources that people have relied on and no longer do (either because the resources are depleted or because they have been replaced by some other resource or technology). Similarly, it can include things that people do not yet use but could with a change in knowledge or technology (see Leach and Mearns 1991). Environmental issues are often concerned with public or semi-public goods, such as an open-access air- and watersheds or common property grazing land. Some aspects of the environment can also involve private goods, such as air inside a place of work or household drinking water. In this paper, we use the term environment in a broad sense to include these various meanings of the term.

Environmental degradation is a subset of environmental change. The term “degradation” can be interpreted in different ways indicating different forms of land use (Blakie and Brookfield 1987). As a working definition, in this paper, we use the term “environmental degradation” to imply:

- * Depletion: damage to a natural resource system, which affects present or future human needs negatively. This harms welfare indirectly by reducing productivity. In this paper, we refer to depletion of a renewable natural resource beyond its rate of renewal rather than depletion of a finite resource.
- * Pollution: leading to damage to human health or decline in the capacity of the environment to sustain natural systems. This harms welfare directly.

1.3 What is the Focus on Poverty Reduction Trying to Achieve?

The Proposed Approach

The Bank's approach has traditionally been based on outputs or projects. Like all other sectors, the environment sector has pursued its own sectoral goals (improving the quality of air and water, protecting ecosystems, preventing further loss of biodiversity, and so on) to achieve maximum benefits for society. Bank staff have usually not explicitly recognized that environmental activities can reduce poverty, and have tended not to pursue opportunities for building the positive linkages between poverty and environment. The Bank has sometimes stated that activities will contribute to reducing poverty, but has seldom quantified the expected poverty outcomes or expended much effort in evaluating the poverty impacts of programs.

In line with the Bank's current focus on poverty, we propose the following approach:

* **Understanding poverty**

Strategies in each country should start from a detailed understanding of who the poor are, the conditions under which they live, and the strategies (or combinations of strategies) they use to maintain their livelihoods (often included in poverty assessments).

Understanding how poor people cope with and adapt to shocks and stresses and make a living without degrading natural resources or compromising the livelihoods of future generations is crucial for poverty reduction. The ability of people to sustain their livelihoods depends on access to various assets such as natural, financial, physical, human, and social capital. This approach provides an important starting point for developing a broad understanding of the determinants of poverty in its different dimensions (livelihood, health, education, violence, and so on). For the environment sector, this could involve:

- Understanding the extent to which the poor depend on natural resources for their livelihoods, and where and how those natural resources are being degraded
- Examining the livelihood strategies poor people use to cope with shocks and crises
- Looking at what sorts of institutions mediate entitlements to various assets and common property resources (CPRs)
- Analyzing how pollution and other environmental factors (dirty drinking water, dirty air, lack of sanitation) affect the health of the poor
- Estimating the ways in which the poor are vulnerable to natural shocks or disasters (droughts, floods, earthquakes, and so on)

* **Focusing on outcome indicators**

Such a strategy can only work if it concentrates on achieving specific targets for the different dimensions of poverty. This approach also requires increased focus on assessing progress toward those targets. The indicators will need to be set and monitored using participatory processes. For the environment sector, this does not imply separate indicators, but rather choosing one or two of the broad indicators that will be most affected by environmental activities—for example, child stunting or life expectancy that would be affected by reducing pollution, or long-term household consumption patterns that would be affected by improved management of natural resources.

* **Choosing public actions that have the highest poverty impact**

The next step is to identify potential interventions for reducing different dimensions of poverty and analyze their likely risks and returns. These interventions would aim both at economic growth (providing the gains are likely to accrue to the poor) and at social sectors and basic services. The Bank would then focus on the interventions that are likely to have the highest poverty impact. In the environment sector, this would mean, for example, reducing indoor air pollution, supporting community watershed management initiatives for improving drinking-water quality, planting trees to combat malaria, and so forth.

Before carrying out specific interventions, however, we need to carefully consider whether to invest in specific regions or countries. Even countries with strong policies in general may have weak environmental policies and institutions. As we know from *Assessing Aid* (World Bank 1998), assistance seems to work best in countries that have the commitment, the policies, and the institutions to reduce poverty. Determining an approach for countries with significant numbers of poor people but little commitment or capability for poverty reduction will be a major challenge. The focus here is on how to support countries that can make external assistance effective.

The Proposed Indicators

Each country team will collaborate with governments and civil society to establish its own set of outcome indicators and targets for improvement.³ One starting point can be a set of typical indicators identified by a board paper that aims to increase the institution's focus on poverty (World Bank 1999). Table 1 is a slightly adapted version, with potential public actions in the environmental area highlighted. However, we need to keep in mind that people's livelihoods are dynamic processes, and therefore the indicators would need to take account of changes in livelihood processes, adaptive strategies, coping mechanisms, seasonality, and so on.

³ This opens up a host of other questions. What will this participatory process look like? What are the criteria for selection of nongovernmental organizations and other grassroots institutions? Are the participating institutions representative of competing constituencies or not? These are difficult questions and will need to be discussed and worked out.

Clearly, many of the outcomes and causes in the different dimensions of poverty are linked in various direct and indirect ways. For instance, lack of adequate sanitation can result in poor health, which in turn can constrain people's ability to earn a living. Undernourished children are unable to benefit fully from their education. If the roads flood during the rainy season, children cannot get to school. Moreover, relationships between individuals, households, community, and nation are intertwined. Hence, indicators developed to reflect changes in livelihood processes would have to take linkages between these levels into account.

Many of the relationships between public actions and the indicators are well known, though often not quantified. For example, collecting urban solid waste is likely to have a positive impact on people's health, including that of poor people. Just because we cannot quantify certain relationships does not automatically imply that a specific intervention is not important. Hence, in constructing indicators, we need to draw lessons both from quantitative and qualitative studies.

Further, we often take certain relationships regarding environment and poverty for granted. For instance, we assume that coastal zone management will result in poverty reduction, or that improving land quality or fish stocks will have a salutary effect on the lives of poor people. But an environmental activity may not be the most relevant or cost-effective intervention for reducing poverty. We cannot assume that these activities will do more for health or livelihoods than other options. Hence, for achieving specific targets with respect to a chosen outcome indicator, we need to work multisectorally and choose between various potential public actions. With a focus on poverty, we would need to demonstrate that an environmental intervention is likely to be the most effective action that will enhance a particular outcome indicator.

First, our objective would change from reducing environmental degradation to giving priority to environmental activities that can result in poverty reduction in one of the dimensions shown in Table 1. This involves choosing one or two indicators and analyzing which activities are likely to have the most positive impact on them.

Second, we would need to work multisectorally and see how environmental activities can be combined with other sectoral activities for the broader goal of poverty alleviation. Our assumption is that there is no single point of intervention and that, in any given context, tradeoffs between different strategies of intervention would need to be negotiated between different stakeholders.

Table 1: Poverty Outcomes, Causes, and Potential Public Action

Outcomes	Examples of Causes	Public Action
Economic Opportunities		Reducing barriers to access to different assets
Private consumption per capita Poverty incidence, depth, and severity Inequality including within specific groups—regional, ethnic, and gender	(i) Income and investment: macroeconomic stability; agricultural productivity; quality of governance; sectoral composition and patterns of growth; (ii) Distribution of assets: distribution of income; distribution of, e.g., land; human capital (iii) Factors impeding access: infrastructure—e.g., roads; gender-based impediments to access to land, credit.	Macro, financial, and trade policies Micro-finance Improve distortionary pricing policies Improve rule of law, governance Clarify land tenure and improve distribution Improve or conserve the productivity of land, fisheries, etc Provide urban and rural Infrastructure Increase spending on and targeting of safety net programs Improve environmental planning systems, e.g., EIA Prevent environmental damage where cleanup costs are prohibitive (e.g., pollution of the water source for a large population center)
Capabilities		Access to essential services
Literacy Infant mortality rate Under-five mortality rate Maternal mortality ratio Underweight children under-five	Quality of schooling; private costs of education; early childhood development; outreach to excluded groups Mother's education; access to safe water and sanitation; breastfeeding; access to health services including immunization; household poverty rates HIV infection rates Household poverty rates; mother's nutritional education; intra-household resource allocation practices	Policies on primary education Action to reduce gender discrimination Immunization AIDS programs Increase access to safe drinking water and "private" toilets Indoor and urban air pollution Spending and policies on curative health for the poor Improve coverage of ante/post natal care Integrated programs to combat vector-borne diseases
Empowerment		Good governance and participation
Participation in decisionmaking	Ability to monitor and influence public resource allocations and service delivery; social cohesion; inequality	Transparency, accountability Effective decentralization Actions on gender discrimination Improve judicial system
Security		Reducing vulnerability
Security against economic shocks and personal violence	External economic and climactic shocks; crop failure; macro-instability Household-level shocks, like accidents, disablement, and debilitating illnesses	Access to risk management mechanisms, e.g., micro-credit Measures to mitigate environment disaster risks (e.g., better-designed infrastructure, better planning processes) Disaster prediction and prevention mechanisms Ensure availability of natural resources to smooth consumption in times of shock

Source: Adapted from World Bank 1999.

2 The Links Between Environment and Poverty

Environmental change affects poor people's well-being both positively and negatively. In this section, we show how environmental change may relate to the various dimensions of poverty—namely opportunity, capability, security, and empowerment. The relationship between environment and poverty is complex and varies according to the local socioeconomic and also the larger macroeconomic policy context. Our aim here is not to be comprehensive. Rather, we highlight specific aspects of this relationship to help us construct indicators for measuring poverty-environment linkages and think through possible ways of intervention.

2.1 Opportunity and Environment

Poor people depend on various activities for their livelihoods. These include farm and non-farm activities, wage labor, petty hawking and trading, and provision of low-cost transportation services. In many countries, the poorest people are landless laborers or farmers with landholdings that are too small to provide an adequate source of income. In urban areas, many poor people obtain their livelihoods primarily through activities within the urban informal sector.

The environment affects the economic opportunity of poor people in both rural and urban areas. In most regions, the majority of poor people live in rural areas and tend to depend directly or indirectly on natural systems for income generation. They depend on various natural resources such as soil and fisheries for subsistence, shelter, and income. Often, they use wild food to complement their diet and to smooth consumption in times of crisis. Many use or sell products such as timber for fuel or convert it into charcoal as a way of supplementing their income. Thus environmental resources provide important inputs into the livelihoods of poor people and also contribute to their well-being.

Complex Relationship Between Poor People and Natural Resources

The relationship between poverty and environment has been the subject of extensive debate. Poor people are often impoverished by a declining resource base and in turn often forced by their circumstances to degrade the environment further (see WCED 1987, Durning 1989, Cleaver and Schreiber 1994, Ekbom and Bojö 1999).

A wealth of recent literature, however, indicates that there is no direct relationship between poverty and environment. Rather, relationships between poverty and environment are far more complex and mediated through various macro and micro-level factors. These include policy measures, markets and prices, local institutional arrangements, gender relations, property rights, entitlements to natural resources, and so on (see Leach and Mearns 1991, Roe 1998, Ekbom and Bojö 1999). Moreover, the specific ways in which poor people depend on natural resources and are affected by environmental changes is not universal but specific to a country or region. Any simple

conclusion or easy synthesis of these relationships is further confounded by the stock of evidence and counter-evidence favoring or undercutting different hypotheses.

Thus we cannot conclude that poor people are always either agents or victims of environmental degradation. For instance, one study shows that massive loss of forests in Mexico is primarily driven by smallholders' need for agricultural land (Deininger and Minten 1999). In the context of Brazil, however, another study shows that large-scale commercial logging rather than pressures on agricultural land posed by an expanding rural population is primarily responsible for the destruction of rain forests in the Amazon (Browder 1989).

Moreover, the causes and solutions of natural resource degradation sometimes lie outside the environment sector. For instance, Heath and Binswanger's study (1999) on Colombia suggests that rather than poverty or population growth, various government policies have had the adverse effect of promoting natural resource degradation.⁴ They argue that despite the recent introduction of more participatory land reform in the country, agricultural policy (including credit policy and subsidies toward specific crops and fertilizers) still supports large farmers rather than labour-intensive family farms. The converse may also be true—natural resource management activities may also be a way to solve other problems that are unrelated to the environment, such as land reclamation initiatives in Uttar Pradesh, India, through the Sodic Lands project, enabling increased access to savings for women through the formation of self-help groups (World Bank 1993).

Possible Conflicts Between Poverty Alleviation and Environmental Protection

In some cases, difficult tradeoffs must be made between poverty alleviation and environmental degradation. For example, industrial development brings jobs but generates pollution, oil exploration leads to risks of water and soil pollution, and a hydroelectric dam can generate considerable revenue for the government but will flood an area of forest. Activities can, of course, be designed to have minimal environmental damage. The projects could even result in net benefit to the environment. Sometimes, however, development activities do harm the environment. That is why we need environmental safeguards.

Time horizons further complicate the relationship between poverty and environment. For instance, reducing income poverty can have a positive or a negative effect on natural resource management in the long term. Coastal dwellers might catch fish for supplemental food, for instance. If their incomes rise, they may buy a boat and bigger net and thus increase the fish catch to unsustainable levels. In the short term income will rise further, but that action may impoverish them or their children in the long run. Conversely, subsistence or semi-subsistence farmers whose land is prone to erosion can, when their income rises, use the increases to invest in soil conservation measures.

⁴ In this context, also see Barbier 2000.

There is also a spatial dimension to the tradeoffs involved at the national/global level, at the regional level, and even at the urban/rural level. For instance, environmental projects leading to provision of water and electricity in one state can result in the large-scale displacement and resettlement of villagers in another, depriving them of their traditional livelihoods. Moreover, consumption patterns by the rich, particularly in industrial countries, can have an impact on the quality of environment elsewhere. The debate about reducing rates of population growth versus carbon dioxide emissions (where industrial countries are responsible for 70 percent of the emissions) by rich countries is one example of this politically charged issue (see UNEP 1995).

How countries understand these tradeoffs, both spatially and temporally, therefore influences both how they define their environmental priorities (for example, should forests be protected because the poor depend on them for their livelihoods or to prevent species extinction?) and the public actions governments choose to remove constraints to environmental conservation.

Disproportionate Effect of Natural Resource Degradation on Poor People, Particularly Women

Since common property resources tend to be more important to the poor than to the rich, the effects of natural resource degradation are also more pronounced on the livelihoods of poor people. Research suggests that the rural poor derive a significant share of their household incomes from natural resources. A study of 197 panel households in 29 villages in the Shindi Ward of southern Zimbabwe, for example, showed that environmental resources accounted for roughly 35 percent of average total income (Cavendish 1999). Many households derived as much or more income from the environment as they did from other sources, such as cash crops, labor, or income from small-scale enterprises. Poorer households tended to depend more on environmental resources. Even though the poor are more resource-dependent, they generally use fewer of these resources than the better-off. In the same study in Zimbabwe, for example, the bottom 20 percent of households by income used three to four times fewer resources than the top 20 percent.

The dependence of poor households on CPRs is in part because of the resource and labor endowments of poor households. For example, with some exceptions, the main input required for using common property resources is human labor (Jodha 1986). Special skills are not typically required. Thus a combination of low opportunity cost of labor and low pay-off from CPR use perpetuates the poor households' dependence on CPRs. Common property resources also play an important role indirectly by helping poor farmers adjust factor proportions in farming. For example, by providing alternative space for grazing, they allow farmers to devote all their land to the production of cash or food crops.

Further, rural poor women are disproportionately affected by the degradation of natural resources because of their particular dependence on communal resources. For instance, they are primarily involved in the collection of fuel, fodder, and water. According to

Agarwal (1997), they can be more severely affected by environmental degradation in at least six possible ways: time, income, nutrition, health, social support networks, and knowledge systems. In many countries, rural women must walk longer distances and spend more time and energy in collecting fuelwood as a result of deforestation. For instance, approximately 10 percent of Peruvian women's time is spent on collecting fuelwood (Foster 1986). This reduces their time spent on income-generating activities, their indirect income through crop production, and the time they can give to household responsibilities.

Contaminated water in rivers and canals is one of the main vehicles for the transmission of diseases. Poor rural women are therefore more exposed than men to water-borne diseases because of the domestic and agricultural tasks they perform. These include fetching water for home and animal care; washing clothes in nearby rivers, ponds, and canals; and rice transplantation, which is mostly done by women in much of Asia and is associated with a range of diseases. Women and children tend to spend more time cooking inside the house and are more likely to be exposed to indoor air pollution (see Ghai 1994).

The burgeoning literature on gender and environment has gone far in showing the limitations of taking the household as the unit of analysis and interrogating differences in intra-household resource allocations. Further, it is important to go beyond merely cataloging women as victims of environmental degradation or focusing on their roles and celebrating them as care-takers of natural resources, as a significant strand of the women and environment literature does (Leach 1994). Rather, it is important to look at gender relations as dynamic and embedded within the political economy of changing natural resource management practices. This involves examining the social, economic, and political context within which resource management practices take place; the gender division of labor; the influence of gender relations on household decisionmaking; women's differential access to land, assets, cultures of inheritance, property rights; and so on. For instance, Leach (1994) shows that in eastern Sierra Leone, tree crop farming can reduce women's access to useful tree products since male farmers have the power to make decisions about which trees to leave and which to cut down.⁵

Importance of Local Institutions

Since access to common resources is often key to the livelihood of the rural poor and plays a crucial role in enhancing their opportunities, questions of property rights, local institutions for management of CPRs, and "environmental entitlements" become central to the issue of poverty alleviation.⁶ For instance, some see weak property rights in forest areas as a driving force behind deforestation (World Bank 1991). In urban areas, slum dwellers, squatters, and migrants often lack tenure security over the land they live on. The illegal nature of settlements combined with poor public infrastructure provision is

⁵ Male farmers may cut trees down, for instance, if they are overshadowing cash crops.

⁶ Environmental entitlements here refers to benefits derived from endowments or access to certain natural resources (Leach and Mearns 1998).

seen as reducing the individual incentive for managing local surroundings, thus contributing to a deteriorating urban environment (Ekbom and Bojö 1999).

There is also some evidence that absence of property rights over land and cattle can reduce women's ability to manage common resources, especially in the context of male out-migration. For example, almost 40–50 percent of rural households in Zimbabwe are female-headed (Moyo et al. 1991). During the 1992 drought, women who managed the cattle and could see the oncoming crisis could not make the decision to sell the cattle before conditions deteriorated. Their husbands, who were living in the city at the time, were consulted through letters but were unwilling to sell the cattle. In the later stages of the drought, as the grass died out, grazing pressure increased on communal lands and rural farmers had to face large cattle losses (Vivian 1994).

The policy lesson, however, should not be simply to privatize common resources as a blanket policy measure for environmental protection (Ekbom and Bojö 1999). Poor communities have often developed local rules and sophisticated mechanisms for managing natural resources. For instance, drawing on numerous empirical studies, including irrigation water schemes in Philippines and high mountain meadows in Japan, Ostrom (1990) shows how people at the local level can manage CPRs sustainably over a long term, and that there are alternatives other than regulations made by a centralized authority or privatization of natural resources for doing so. Moreover, there is ample evidence that the shift from communal property rights to state and individual control has exacerbated environmental degradation in many places (see Colchester 1994, Agarwal 1997). The point here is that local institutions are important, and the distributional impact they have depends on the particular form they take in different circumstances.

Poverty/Environment Linkages in the Urban Context

Perhaps because the largest proportion of poor people lives in rural areas, and because in most countries rural poverty indices are much higher than for urban areas, rural poverty is much better researched than urban poverty (see de Haan 1997). Urbanization is rapidly increasing, however, and according to some estimates almost 65 percent of the world will live in urban areas by 2025. These areas include not just mega-cities but small and medium-sized towns. In developing countries, high levels of air and water pollution, slums, deteriorating infrastructure, and poor waste management systems characterize many cities and towns. Having to scrounge around for food and shelter, the poor are often the most affected.

In urban areas, the links between environmental factors and poverty are strong, though they are of a different nature than in rural areas. While rural poverty is more correlated with ownership of land (though gradually less so), in urban areas vulnerability is strongly related to lack of tenure security, ghettoization in slum areas, inadequate sanitation and water facilities, violence, labor market status, commodity prices, and migrant status (de Haan 1997). A large percentage of city-dwellers inhabit slums and shantytowns that have little or no access to basic services such as clean water, sanitation, and waste disposal. Often these slums tend to be close to industrial sites, waste dumps, and polluted rivers

and canals. Hence the poor are at greater risk of exposure to air- and water-borne diseases.

In a study involving surveys of 1,000 households in the greater Accra metropolitan area, Ghana, the authors explained intra-urban differences in morbidity and mortality in terms of unequal access to resources that help households protect themselves from environmental risks (Songsore and McGranahan 1993). They found, for instance, a strong correlation between socioeconomic characteristics and children's diarrhea prevalence. Thus 22 percent of children in the poorest quintile but only 9 percent in the richest quintile were subject to diarrhea in the two weeks prior to the interview. The authors explain such disparities in terms of differences between poorer and richer households in access to various environmental services (safe water and sewerage, for example) and lack of knowledge or inability to prevent diseases.

Many factors contribute to deteriorating environmental conditions in cities and towns in developing countries: effluents and industrial wastes dumped into river waters, excessive withdrawal of water, agricultural runoff containing pesticides that eventually find their way into drinking-water supplies in urban areas, and religious and social practices such as disposing animal carcasses and household wastes into rivers. Noxious fumes from burning garbage containing plastics and other toxins plague air quality in many cities. In some cases, large numbers of poorly maintained vehicles are an important source of air pollution. Added to these are problems related to corruption and ineffective institutional and organizational structures. In India, for instance, the Pollution Control Boards often sit complacently and work in cahoots with industrial polluters. The Central Pollution Control Board has set air quality standards that are more lax than suggested by the World Health Organization. In Delhi, due to flawed pricing policy, diesel accounts for 65 percent of the petroleum-based fuels.⁷ Studies have indicated that diesel automobiles are major contributors of small particulate matter in Indian cities. Yet monitoring of air quality remains far from adequate.

While the poor consume less water and energy than the rich and contribute less to environmental pollution, they often bear a disproportionate burden of environmental hazards. Lacking adequate shelter, the urban poor spend more time outdoors and are more exposed to air pollution. In addition, since slums rarely have provisions for clean drinking-water supplies, the urban poor often resort to obtaining water for cooking and other household purposes from polluted rivers and canals. This results in various water-borne diseases and ailments.

As informal laborers, the urban poor often play an important role in environmental protection, though this role is rarely recognized as such. For example, it is estimated that rag pickers collect almost 12–15 percent of the total waste produced in urban areas in India. They collect various items such as paper, plastics, metals, and glass containers. In addition, others buy reusable material from different houses and sell them to traders. In doing so, in the city of Delhi, these informal workers save the Municipal Corporation of

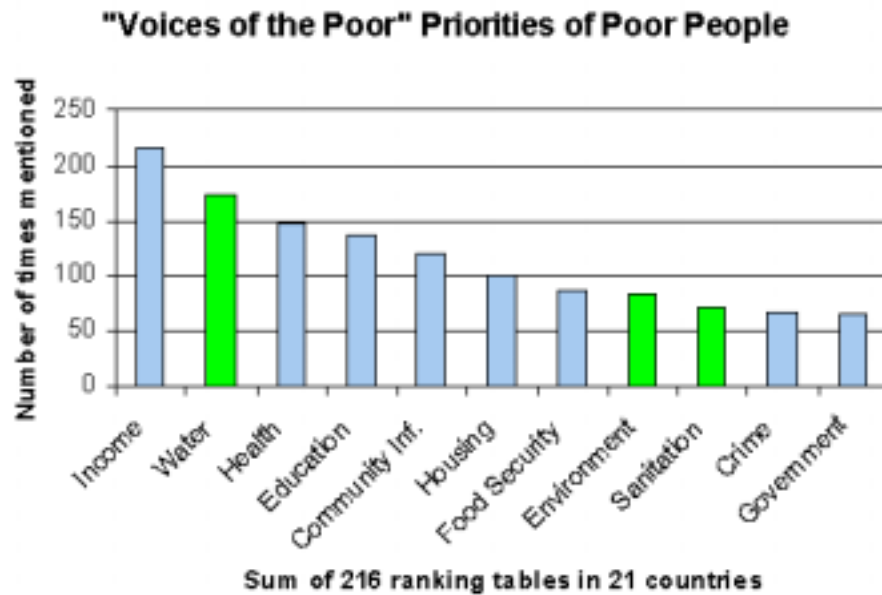
⁷ For an extended discussion see State of the Environment Report published by the Center for Science and Environment, India (CSE, 2000)

Delhi approximately Rs 372,000 (\$9,300) to Rs. 450,000 (\$11,250) a day (*Down to Earth*, 31 January 2000).

The Poor's Assessment of Natural Resource Problems

Many participatory studies ask poor people to define what it means to be poor. The studies also ask people to rank their problems or the causes of their poverty in order of importance. It is striking that issues relating to environment feature often in these rankings, although they are seldom the first priority issue.

Figure 2.



Combining the findings of ranking exercises in 217 surveys in 20 countries in five regions shows considerable consistency.⁸ (See Figure 2.) Income (including access to markets, credit, and productive assets) ranked as the most important issue in all the exercises. Water was next, mentioned in 80 percent of the surveys, more often than food security or health. Box 1 highlights typical perceptions of poor people about their access to drinking water. Forty percent of the surveys ranked issues relating to natural resources (drought, floods, firewood, pollution, soil erosion) as priorities, and one-third of them mentioned sanitation or waste disposal.

⁸ The countries included were Bulgaria, Kyrgyzstan, and Uzbekistan in the ECA region; Vietnam and Indonesia in Southeast Asia; Gabon, Mozambique, Ghana, Zambia, Kenya, Cameroon, Ethiopia, Nigeria, and Malawi in Africa; Ecuador, Panama, Peru, and Brazil in Latin America; and India and Bangladesh in South Asia.

Box 1. Looking for Water

Oldadai, Arusha, Tanzania : “Women are most affected because they have to lose most of their time searching for water. During the dry season, from August to January when the springs become dry, we have to walk 2 km to Kishimbo to get water. When we reach there, we find that there are so many people lined up for water, it takes six hours to get one bucket of water.”

Southwest Province, Cameroon: “sometimes...the water is brown. We call it tea, but we drink it anyway.”

Kansur, Pakistan: “The most pressing needs of poor urban communities relate to water and more particularly sanitation. In the absence of latrines people are forced to use open spaces....For women this was expressed as representing a particular problem as they are confined to relieving themselves before dawn or after dusk and are often victims of sexual harassment or attack.”

Choosing an Indicator for NRM and Poverty Work

Income- and consumption-based measures are of limited use here. Measuring the success of an intervention by the income of the beneficiaries could lead to serious problems. It would be necessary to consider whether increasing income is associated with sustainable use of natural resources. Further, it would be important to see whether a rise in income is short-term or can be maintained over an extended period of time.

As discussed earlier, the relationship between environment and poverty is also context-specific. Hence using a single variable across different regions may not work. In different contexts, different indicators or combination of indicators could be used. For instance, changes in labor time could be tracked with respect to changes in the state of the natural resources. How does shortage of fuelwood affect women’s labor time? Or how do different forms of land use (household or communal) influence women’s time spent on subsistence farming? Another indicator is the number of workdays per year, to measure people’s access to gainful employment. Once again, this would need to be considered in the context of sustainable use of natural resources.

Another indicator is to look at changes in people’s access to assets (economic or social) or the extent to which the poor are able to cope with shocks and stresses. Analysis of institutions that govern access to these assets is key here. The productivity of natural resources could be considered, along with how different communities draw upon them to maintain their livelihoods. This relationship is mediated by many factors, not all of which can be quantified (for example, the nature of local rules and institutions, history of use of natural resources, and so on). Hence understanding these relationships would involve both quantitative and qualitative methods.

2.2 Capabilities and Environment

In addition to the source functions just described, the sink function of natural resources (absorbing pollution, for instance) plays an important part in people's well-being. When those functions are impaired, the poor seem to bear a disproportionate share of the burden.

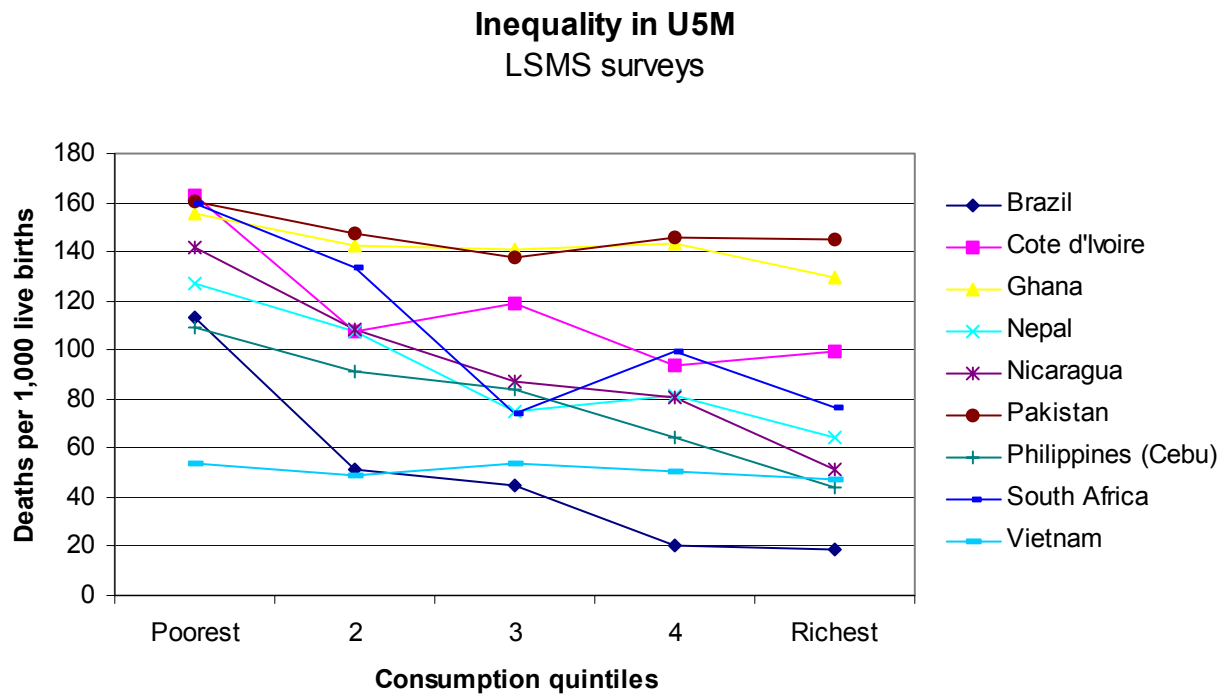
There is little doubt that environmental factors are major components of the burden of disease in developing countries. For example, one study estimates that 20 percent of the total burden of ill health in one state in India is due to environmental factors. In this case, environment is considered as including household water supply, toilets, wastewater collection and treatment, indoor air pollution, agrochemical pollution, and urban air pollution (Hughes, Dunleavy, and Lvovsky 1999). By far the largest cause of disease was lack of access to adequate water and sanitation.⁹

Furthermore, the diseases related to environmental factors affect the income-poor disproportionately. Respiratory infections and diarrheal diseases are the two biggest causes of death among the poorest 20 percent of the world's population, as ranked by gross domestic product (GDP) per capita. They are responsible, respectively, for 13 percent and 11 percent of the deaths of the poor. Malaria is the tenth biggest killer of the world's poor, responsible for 4 percent of the deaths. By contrast, respiratory infections are responsible for only 5 percent of the deaths of the richest 20 percent of the world's population, with diarrheal diseases and malaria making almost no contribution. Respiratory infections and diarrheal diseases are between them responsible for 33 percent of the total poor-rich mortality gap (Gwatkin and Guillot 1999).

Within individual countries, the differences are even more striking. Under-five mortality is almost without exception higher for people in the poorest one-fifth of the population (by consumption)—and sometimes considerably so.¹⁰ A poor child in Brazil is six times more likely to die than one born into a wealthy household. Figure 3 shows this for several countries. Annex 1 shows health outcomes by wealth quintile for a different set of countries. Annex 2 shows inequalities of health outcomes and of access to water and sanitation for Peru.

⁹ This study considers water and sanitation related diseases to be diarrhea, filariasis, *H pylori* peptic ulcers, helminthic infections, Hepatitis A and E, poliomyelitis, protein energy malnutrition, trachoma, typhoid and paratyphoid. Amoebiasis, cholera, giardiasis, Shigella, and rotavirus are included as diarrheal agents. Forty percent of gastroenteritis is attributed to water supply and sanitation disease agents. Vector-borne diseases (Japanese encephalitis, malaria, leishmaniasis, onchocerciasis, shistosomiasis, guinea worm, dengue, and yellow fever) are not included.

¹⁰ Under five or child mortality is the most common health outcome used, largely because (sadly) it is easy to measure and is widely captured in survey data. It captures the effects of environmental inequalities more than infant mortality does. Child stunting (low height for age) is another measure relevant to environmental activities. If a child has a disease such as diarrhea, it is harder for the individual to convert calories into growth.

Figure 3. Inequality in Child Mortality

Source: Wagstaff 1999

Another striking feature is that countries with the same level of per capita incomes can have vastly different health outcomes. Tanzania and Malawi, for example, both had a 1998 per capita income of around \$200, yet child mortality in Malawi was nearly double that in Tanzania. Malawi's rate is more than four times higher than that of Vietnam, which had a GDP per capita of \$330 in 1998. This shows that policies and local conditions and customs can have a major impact on outcomes, independent of economic growth.

How much of this difference can be attributed to "environmental" factors? A study of rural and urban households in Cebu, Philippines, found that inequality in consumption was the principal factor explaining inequality in child mortality. The next most important contributors, however, were inequalities of mother's education and inequalities in sanitation. The type of drinking-water source did not explain much of the difference, though its location (inside or outside the house) did appear to affect the likelihood of child survival (Wagstaff 1999). The study did not investigate the contribution of indoor or urban air pollution nor that of solid waste collection in explaining these differences, largely because of lack of data.

It seems reasonable, therefore, to conclude that certain environmental problems cause a substantial part of the burden of disease in poor countries and that often the effects of these are disproportionately borne by the poor. These relate to communicable and vector-borne diseases (largely the result of dirty water and parasites breeding in stagnant water)

and to respiratory infections (largely from indoor air pollution and from urban air pollution in some parts of the developing world).

2.3 Security and Environment

Poor people tend to be more vulnerable to shocks of all kinds, but particularly to shocks inflicted by the natural environment. They tend to live in environmentally vulnerable areas (Leach and Mearns 1991). In rural areas, their land is vulnerable to droughts or floods. In urban areas, the poor may live in unstable housing on steeply sloped land, which puts both them and their property at increased risk from floods, hurricanes, and so on. A recent study on the impact of the 1998 cyclone on the slum residents in Dhaka, Bangladesh, recounted the shame felt by poor women who were compelled to defecate in open areas due to lack of proper latrines (Rashid 2000).

More important, the poor have less capacity to cope when those shocks occur. Access to credit is lower than that of better-off households, and they have fewer assets to sell or consume in times of hardship. These issues arise consistently in participatory studies, such as those included in the *Voices of the Poor* project, indicating the extent to which poor people feel vulnerable to natural shocks and the impact on their well-being.¹¹ Box 2 illustrates typical concerns.

Box 2. The Effects of Natural Shocks

Ethiopia: “It was...on Abera’s wedding that we had the first showers of rain. After four days, heavy rainfall started. Since then, it did not give us time and continued pouring from one day to the other. It is at the wrong time and the amount is excess...What we planted in February should have been ready for our children...Most carry fuelwood to the town and buy food, but the price of fuelwood is low because we are competing amongst ourselves. Those who have them sell their oxen and survive on it. If the crops fail later, they will also sell firewood.”

Bolangir, India: “The consumption level of a poor household drops by 50 percent in the wake of droughts...The women are expected to take their meals only after others in the household have finished eating. More often than not...women are left with practically nothing to eat...In the course of the study, some instances whereby girls below the age of 10 had been sold in lieu of money also came to the fore.”

Vietnam: “When it rains, black water from the dyeing enterprises sometimes overflows into homes.”

Zambia: “Climatic conditions were rated by farmers as amongst their most severe problems...The changes in grazing and water patterns for livestock which were necessary...either took children out of school or, in smaller households, made livestock keeping nonviable.”

¹¹ This initiative, as part of *WDR 2000/2001*, has collected participatory poverty assessments from 70 countries. See <http://www.worldbank.org/poverty>.

Baytsema, Ethiopia: “[most farmers saw an increase in income] those who did not benefit were described as those who had lost their assets in the 1994 drought or earlier.”

Cotonou, Benin: “Some 10,000 houses in Cotonou (about 10 percent of the total) are vulnerable to flooding....Rents and land plots are priced, amongst other things, according to their likelihood of flooding, so in many cases the poor can only afford housing that will have them living with water up to their ankles for three months a year. As a result, diarrheas and respiratory tract infections...are rampant, thus affecting productivity; street trade is almost impossible, thus pushing prices up and depriving many petty traders of an income; and houses and household items are damaged, thus requiring new investment every year.”

Poor people do have complex and sophisticated strategies for coping with shocks, natural and otherwise. These are often related to natural resources (NR). Numerous studies document that poor people consume bushmeat or wild plants in times of drought (NR response to NR shock). Some poor people cultivate trees as “savings” for circumstances such as funerals where the costs are high but the timing unpredictable (NR response to non-NR shock) (Chambers and Leach 1989). Family members may migrate in response to climatic shocks (non-NR response to NR shock).

Microcredit can play an important consumption-smoothing role. In the 1998 floods in Bangladesh, microcredit schemes from Grameen and hundreds of nongovernmental organizations played a crucial role in relief and rehabilitation. Microcredit clients went out of their way to repay, even reducing consumption and borrowing from relatives to be able to do so, as a way of ensuring access to larger loans if needed (Shah 1999). Families build social capital in normal times by sponsoring ceremonies or investing in clothing and the like, in order to ensure some protection from the community in times of shock. Nevertheless, in many circumstances, natural shocks often have catastrophic effects on poor people, very often disproportionately on women.

Recent studies underscore that the types of livelihood strategies used by the poor are both complex and diverse. For instance, in slack seasons, people often diversify their livelihoods with fallback activities so as to reduce risk (Chambers & Conway 1992). In some cases, as common resources diminish, farmers use private land to re-establish availability of resources. In other cases, rather than one type of seed being stored, farmers store many different varieties, and plant specific ones depending on how the season unravels. Sharing the rearing of livestock is another strategy used by the poor across regions and countries (Beck 1989). The construction of fishponds in semi-humid conditions allows farmers to establish many nutrient linkages with other aspects of a farming system. The fish, for example, consume crop residues and leaves, and fish manure in turn contributes to soil fertility (Chambers & Conway 1992).

In a recent article, Scoones (1998) distinguishes between three different livelihood strategies: agricultural intensification, livelihood diversification, and migration. Identifying what sorts of resources are required in different contexts for pursuing different livelihood strategies can be an important tool for intervention.

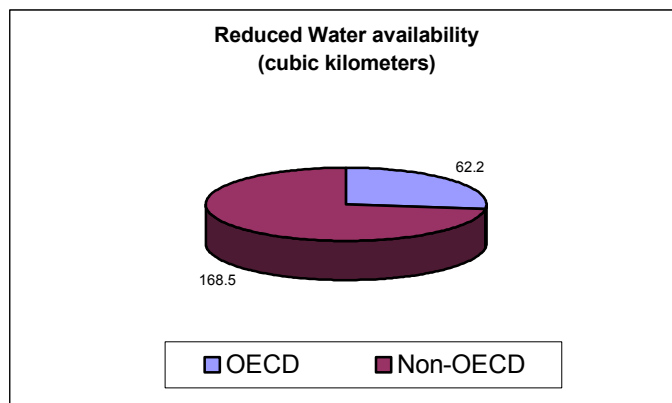
2.4 Global Issues and Poverty

The Bank has different objectives in addressing global issues than in its regular development activities. For that reason, they are funded from separate sources. It may be unreasonable, therefore, to measure global activities against a poverty standard. If global issues are to be mainstreamed, however, it is worthwhile assessing the implications of a poverty focus on the global environmental agenda.

Climate Change

As indicated, natural disasters and climatic variability have a disproportionate impact on the poor. For example, according to one estimate (Smith, 1992), the death toll from tropical storms in middle and low income countries is at least 10 times higher than in higher income countries. For example, the average number of deaths per event in Japan is 23, compared to 196 in middle income Philippines (ibid.). Further, Frankhauser (1995) argues that greenhouse impacts are likely to be much more severe in developing countries compared to the OECD (p. 54). Calculated for the year 1988, he argues that leaving aside the Soviet Union, the damage from CO₂ emissions for non-OECD countries is \$70 billion, constituting about 6.7% of their GNP.

Malaria and other vector-borne diseases tend to be concentrated among the poor. If global climate change increases climatic variability and allows malaria to spread, as many have predicted, it seems reasonable to hypothesize that the impacts will fall predominantly on the poor. Some of the benefits of efforts to reduce climate change, therefore, will accrue to the poor. And although it will be difficult to show, reducing the extent of climate change can be seen as having an important impact on reducing future poverty.



Source: (Frankhauser, 1995)

Efforts to reduce the causes of climate change in developing countries, however, are not likely to be pro-poor. Except for interventions such as insulation of housing in cold countries, or some technologies that simultaneously reduce emissions of other pollutants in small-scale polluters such as brick or charcoal kilns, most are irrelevant to the poor. Most poor people do not have electricity, and if they are just starting to receive it, they

are likely to be indifferent about its source as long as there are no cost implications. If global climate change interventions increase the price of electricity, they could have a negative impact on the poor.

Biodiversity

Some biodiversity activities are clearly pro-poor, though the complexities of the relationships just described remain true. Where poor people clearly depend on rangeland, forests, or aquatic resources for income, food supplements, or use in times of crisis, and where those resources are depleting and communities have no reasonable alternatives, biodiversity conservation activities can be the best way to reduce poverty in that area. Similarly, increasing the productivity of natural resources in a sustainable fashion (such as forestry in ECA) can have direct impacts on economic growth. Indeed, some biodiversity projects funded by the Global Environment Facility (GEF) are more pro-poor than many IBRD/IDA environment projects (see next section).

In other cases, these activities are more tricky. Some conservation initiatives can involve costs for poor people by reducing their access to certain resources. One example is tree planting and forest protection programs in Central America, which have often ignored the need for basic food supplies of the rural poor (see Uttig 1994). The literature contains much discussion of inter-temporal or inter-generational allocations. We could, perhaps, decide that it is reasonable to impose a cost on today's poor in order to protect future generations from poverty. This may be appropriate in some circumstances, but it is not generally true, for two reasons. First, people's desire for a clean environment appears to increase sharply with income. Reducing today's poverty may be the most sustainable way to conserve biodiversity in the long run. Second, we have little certainty about the distribution of the future benefits of conservation efforts.

If our objective becomes poverty reduction, therefore, we would still have a large portfolio of biodiversity activities, although their scope and focus would be different. We would probably not be able to justify some current biodiversity activities.

Ozone-Depleting Substances

Projects to eliminate the manufacture and use of ozone-depleting substances appear to have little direct relationship with poverty reduction, and even indirect relationships (economic growth or employment generation) are quite tenuous.

International Waters

Some international waters projects would probably have some poverty impact. A project that worked with small farmers to reduce nonpoint source pollution, for example, probably has a positive impact on their welfare, directly through fertilizer storage and indirectly through building up local community-based institutions. These activities are, however, by their very nature unlikely to be the highest priority poverty reduction interventions.

2.5 Environment and Empowerment

Environmental activities can provide an important focal point around which communities can organize and empower themselves. The ability of rural women in Vidarbha, India, to successfully organize around water issues is an excellent illustration of this. (See Box 3.)

Box 3. Women's Empowerment and Village Water Supply

In villages in the arid region of Vidarbha, Maharashtra, India, women and girls spend much of the day walking to fetch the water required for a household. The village recently formed women's organizations (*mahila mandals*), which allowed them to share knowledge about the time they spent fetching water and about possible links between the quality of water and their health. Through these organizations, they realized that not only they and their neighbors had little access to safe water, but that the problem was pervasive in all 10 surrounding villages. This created strong community awareness. The women formed alliances with the female members of the local village council (*panchayat*), held protest marches, and performed street plays.

One result of their efforts was to pressure the *panchayat* to repair malfunctioning tubewells and revive a running water supply scheme. As a result of the women's efforts, within six months, 17 community wells were deepened in eight villages and pipelines were laid for drinking water in two villages. The women also initiated programs for social forestry and rainwater harvesting to protect the environment. For the first time in recent history, there was sufficient safe drinking water in seven villages during the summer months of 1997.

Source: Devasia 1998.

Participation by local communities in decisionmaking around management of environmental resources can eventually help them to maintain their livelihoods, gain equitable access to resources, and use these resources sustainably. An example of this is the Joint Forest Management Program in Andhra Pradesh, India. (See Box 4.)

Box 4. Joint Forest Management in Andhra Pradesh, India

Since 1992, Andhra Pradesh (AP) has embarked on an ambitious program of joint forest management (JFM). As of March 1998, some 3,665 Forest Protection Committees had been formed at the village level, with oversight of almost 900,000 hectares (ha), of which some 170,000 ha had been treated. This movement is said to engage about 650,000 people, and 150 NGOs are associated with the implementation of JFM in AP.

The World Bank is already involved in forest rehabilitation and conservation through the Andhra Pradesh Forestry Project, with an IDA credit of \$77.4 million. This project was launched in 1994 with the main objectives of supporting the regeneration and afforestation of degraded forests, plantation forestry, expansion of community forestry, research, and protected areas management. After reconstruction in early 1997, it has achieved good results in terms of regeneration of degraded forests and JFM support.

Source: World Bank project documents and staff.

While emphasizing the importance of local participation, it is also essential to underscore the role that local and national government can play in “scaling up” local networks into effective development organizations (Evans 1996). Communities are marked by social differences and relations of power and inequality around factors such as gender, race, caste, class, and so on. Any attempt to organize and involve local social capital should take into account these differences in interest and power.

Education about environment-poverty links must be part of any long-term environmental strategy. Often, awareness about the negative environmental externalities or adverse impact of certain development projects on the livelihoods of poor people does not go beyond the communities that are most severely affected by it. For instance, urban consumers of fuelwood may be scarcely aware of the consequences of increased logging on the livelihoods of the rural poor. Environmental education can play a particularly important though indirect role in informing different segments of the local population about issues relevant to the community and negotiating local conflict. This becomes even more salient in the context of weak local environment institutions.

A key aspect of many environmental projects is institutional capacity building, which mostly focuses on training personnel within environmental ministries or programs. Such an approach to capacity building often has limited success, in part because it is de-linked from the concerns of the community. Here, too, environmental education can play an extremely powerful role in the long run in creating demand for effective local institutions and laying the cultural groundwork for effective political action.

Awareness about environmental issues can be raised by public and private agencies, grassroots institutions, changes in school curricula, and creative use of the local media. For instance, even in the absence of direct links with political parties, various environmental conflicts in developing countries have gained national attention because of the work done by the media and some professional groups. Many development projects attempt to involve local communities in various stages of planning as a way of making the project participatory. This suggests that environmental education is a dynamic and two-way process that can enable both local communities and development institutions to be more responsive and accountable.

3 Poverty Focus of the Current Portfolio

To identify the extent to which the present portfolio is poverty-focused and to determine how it might change with explicit poverty targeting, we looked at part of the environment portfolio in Brazil, Indonesia, and Zambia. We analyzed 31 projects: 10 natural resource management (NRM) projects (32 percent); 12 water supply and/or water quality (WS&Q) projects (39 percent); 4 general environmental protection projects, which include strengthening of the environment ministry (EP) (13 percent); 3 NRM projects funded by GEF (10 percent); and 2 industrial pollution (IP) projects (6 percent).

3.1 Methodology for Portfolio Analysis

The objective of this analysis is twofold: to understand the extent to which the current portfolio of environment projects is pro-poor, and to see whether we would favor certain types of projects if we put a higher priority on pro-poor projects. Because no detailed impact analysis exists for large numbers of projects that differentiates between impacts on poor and non-poor beneficiaries, we used information laid out in the PADs or SARs of projects. That is, we analyzed what the projects stated as their expected benefits at the time they were approved by the World Bank's board, rather than the actual benefits that the project achieved during and after implementation.¹² The analysis had three steps:

- * Calculate the economic efficiency and the poverty focus of each of the projects. The economic efficiency calculation takes cost and benefit data from the project documentation and assumes that benefits equal costs if the projects have not calculated their expected benefits. Poverty focus is measured as percentage of the beneficiaries below the poverty line. We used data from poverty assessments (at the lowest level of aggregation) if the projects did not indicate the percentage of poor reached.
- * Rank the projects according to their benefit-cost ratio, whereby we compared a ranking where benefits accruing to the poor and non-poor are weighted equally with a ranking that gives a preferential weight to benefits to the poor.
- * Compare the performance of the environmental portfolio to a benchmark, called in this case the "breadline." In this instance, we compared the project's benefit-cost ratio and weighted benefit-cost ratio with a universal transfer of money to the whole population (which has an administrative cost, making its benefit-cost ratio less than one).¹³

This analysis assumes that each project achieves what it claims in the original documentation. It also assumes, unless the documentation claims otherwise, that benefits accrue to the poor in equal proportion to the poverty rate in the area. Both assumptions are generous. In reality, most projects probably perform less well on both counts. In addition, since most projects do not detail either expected impacts on the poor or a quantified cost-benefit ratio, the assumptions reduce the amount of variation between projects in the analysis.

¹² Clearly, true impact analysis would be preferable, but also prohibitively expensive. The objective here is to analyze the existing portfolio relatively quickly to give an indication whether any type of environmental project systematically appears to reach poor beneficiaries disproportionately.

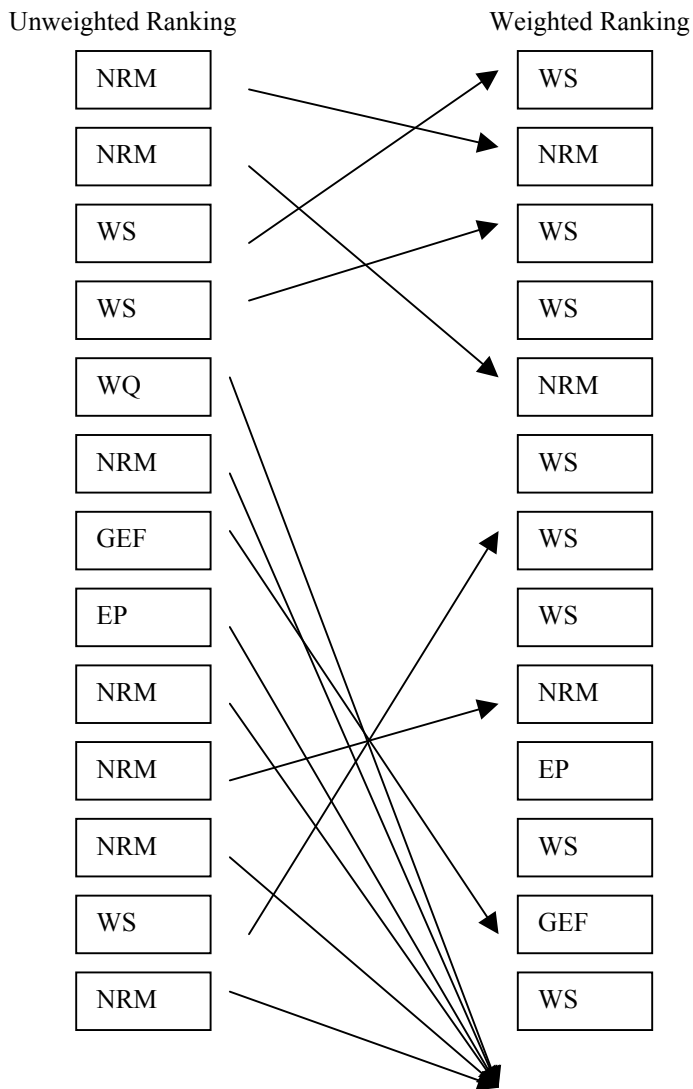
¹³ This is a low hurdle. As the work progresses, we will develop a more exacting standard.

Ranked according to the unweighted benefit-cost ratio, the top 13 projects include 7 NRM activities (54 percent), 4 water (30 percent), 1 NRM/GEF (8 percent), and 1 general environmental project (8 percent).¹⁵ If we rank according to the weighted benefit-cost ratio, however, we have 8 water (61 percent), 3 NRM (23 percent), 1 environment (8 percent), and 1 NRM/GEF (8 percent) among the top 13. Therefore, there may be a slight shift toward water supply and away from NRM. (See Figure 5.)

In the weighted ranking, GEF projects do not perform worse than IBRD or IDA projects, which is surprising given that the GEF aims for global environmental benefits and not local development impacts. Two general environmental projects and two industrial pollution projects are among those that perform worse than the GEF projects in this exercise. The GEF projects included here, however, are all biodiversity projects, which tend to be in rural areas where the proportion of poor people is high. Montreal Protocol and climate change projects are not expected to perform as well (and will be included in the analysis soon).

¹⁵ Many projects had no explicit benefit calculation. In those cases, we mostly assumed that benefits are equal to costs. This gives a cluster of benefit-cost ratios at one.

Figure 5. Ranking of Projects with and without preference for benefits to the poor



Performance Relative to a “Breadline”

Here, we compare the environment portfolio with a benchmark or “breadline.” In this case, the breadline is a uniform transfer of money, with an assumed loss of 20 percent in the administrative process. We can think of this as a money-distributing helicopter with a very expensive pilot. This transfer is not targeted toward the poor, but can be weighted for benefits to the poor in the same way as the project. This allows comparison among different types of projects, and could be extended to other sectors.

All the environment projects perform better than the breadline when they are unweighted (which is inevitable because of the assumptions made in the analysis). In the weighted analysis, however, 8 of the 31 projects (26 percent) were less effective at reaching the

poor than our helicopter. These projects were 2 industrial pollution (all the IP projects in this sample) and 6 NRM (60 percent of the NRM projects).

4 What Would a Poverty-Focused Environment Portfolio Look Like?

It is substantially easier to characterize the relationships between poor people and the environment than it is to recommend potential solutions to these problems. The Bank's portfolio already includes many environmental activities that focus on poverty outcomes. Box 5 highlights two examples. Because so many of the problems are context-specific, the principal conclusion is that if we wish the environment sector to focus more on poverty, our activities should follow the approach outlined in section 2 and focus on improvements in key indicators of well-being of poor people in each context. Most types of projects can bring benefits to poor people, depending on how they are designed, where they are located, and so on. So a decision to increase the poverty focus would lead us to prepare projects differently rather than to prepare different types of projects. In addition, certain types of environmental projects appear to be easier to reshape in a way to increase poverty-reduction benefits.

- * Environmental health. The clear relationship between environmental issues and the capabilities of the poor makes projects focused on environmental health more prominent. Projects focusing on indoor air pollution, increasing coverage of individual toilets for each household, increasing coverage of water supply for each household, and reducing urban air pollution in some urban areas would increase in prominence. Inter-sectoral projects to reduce vector-borne diseases such as malaria would also be important. Of course, achieving these goals will continue to be operationally difficult—for instance, we are not advocating returning to the basic needs approach of a few decades ago. We know, however, that the goals are important for poverty reduction.
- * Natural resource management. The question of improving natural resource management to reduce poverty is trickier. As discussed, the relationships are complex and can vary from one context to another. One important lesson emerging from this literature is that people are agents and that a lot can be learned from how they use natural resources as inputs into their livelihoods and how they value them as a consumption good (Anthony Bebbington, personal communication). Further, institutions governing access to natural resources are important. A study of these institutions opens up multiple entry points (Scoones 1998). Our objective is ultimately to see what sorts of interventions in natural resource management can result in poverty alleviation in its different dimensions.

It will be harder to focus industrial pollution projects and general environmental capacity building projects on the poor, although in both cases this will depend on the local circumstances.

Box 5. Examples of Poverty-Focused Environment Projects

Reclamation of Sodic Lands in Uttar Pradesh (UP), India

Some 1.2 million hectares or 10 percent of the net cultivated area in UP is sodic (excess salt), and 95 percent of the landowners in sodic areas are marginal and small farmers with holdings of less than 1 ha. By 1989, the Government of India and the state government of Uttar Pradesh had successfully reclaimed 157,000 ha of this land. These efforts, however, had several weaknesses, including limited institutional coordination and lack of beneficiary participation. In 1993, the Bank financed part of this program with an IDA loan of \$55 million with the aim of reclaiming 68,800 ha of land. The Bank's focus was on involving the beneficiaries, 60 percent of whom fall below the official poverty line. Key aspects of the project included land reclamation through improvement of drainage network and institutional development.

So far, 47,470 ha of sodic land have been successfully reclaimed, and 23,956 ha of sodic land have been put under cultivation for the first time. Cropping intensity increased from 37 percent to 230 percent. The project, which is basically an agricultural project, has also had numerous positive impacts both on the poor and on the environment. It has enhanced the income level of beneficiaries by raising their farm income through increasing crop productivity. Intervention has also improved land allotment and possession process. A total of 20,185 ha of land have been allotted to 45,600 beneficiaries. Moreover, during the second, third, and fourth phases of the project (1994–97), 12,706 people who had previously been allotted government land were able to get effective possession. In some areas wage rates have doubled and land values have quadrupled. There has also been considerable decline in seasonable labor migration in project villages. The project has also helped women gain access to wealth through joint ownership of allotted land and increased access to savings through the formation of self-help groups. It is estimated that almost 200,000 families will benefit by the end of the project. Further, soil quality has improved, with no negative impact on surface and groundwater quality so far.

Zambia Environmental Support Program

In 1997, with the help of a \$10-million loan from IDA, the Government of Zambia set up an environmental support program to better manage environmental resources in the country. The program was part of a multidonor effort. Among other things, the program financed the setting up of a pilot environmental fund especially targeted to poorer communities in order to provide an incentive mechanism for the development of environmentally sound community-based projects. One objective was improving the livelihoods of the poor (especially female-headed households) by helping them use natural resources better. The fund helps eligible communities determine their priorities and finances the projects they identify as priorities. Eligible subprojects include:

- Community woodlots, including charcoal production and non-timber forest products
- Soil and water conservation, including flood and drought preparedness
- Reforestation
- Renewable energy
- Community water supply and latrines
- Wetlands for fisheries
- Activities to reduce vector-borne diseases such as malaria and bilharzia
- Waste management activities

5 Conclusions

- * Environmental factors affect several dimensions of poverty:
 - Opportunity declines when poor people who depend on natural resources for their livelihoods can no longer do so because of environmental resource degradation and lack of reasonable alternatives.
 - Capacity is impaired when poor people’s health is damaged by dirty water, by dirty air, or by diseases related to the environment (such as malaria). Illnesses related to the environment are some of the biggest killers and causes of sickness among the poor.
 - Security is threatened by natural disasters and climatic variation. The poor tend to be more physically vulnerable to natural disasters and have fewer resources to enable them to ride out the shocks.

- * A focus on poverty outcomes in particular countries or areas would result in several high-priority environmental activities, where environment is broadly defined to include private goods such as water supply and indoor air quality. Some of these would be stand-alone environmental activities, but most would involve working cross-sectorally—for instance, working with rural sectors on land productivity, with health sectors on malaria reduction, with infrastructure sectors on increasing coverage of toilets, and so on.

- * A poverty-focused environment strategy might require changing the design of operations more than the sectoral composition of the portfolio. Operations in areas with large poor populations or those that make specific efforts to reach the poor should clearly be preferred. It is possible to envision pro-poor projects of every type, although industrial pollution projects, general environmental strengthening projects, and some biodiversity projects may fall in priority relative to water supply, basic sanitation, disaster protection, natural resource management, and vector-borne disease reduction projects. The fundamental change would be one of approach—picking a key poverty-related indicator, choosing the most effective type of intervention, and quantifying its effects on that indicator.

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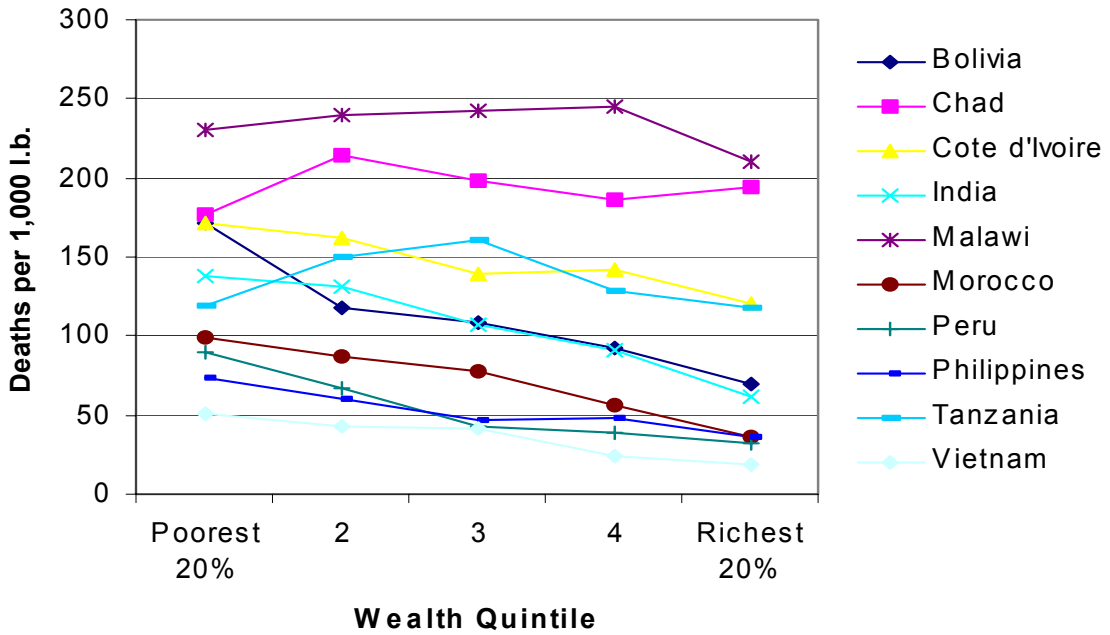
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Annex 1

Inequalities of health outcomes by wealth quintile (asset index)

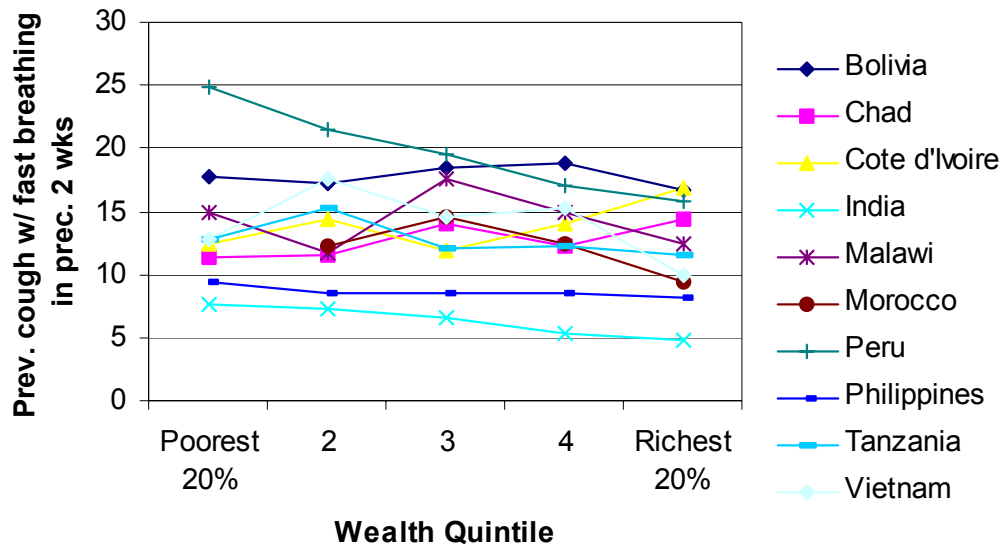
Inequality in U5 Mortality Outcomes



Inequality in Stunting Outcomes



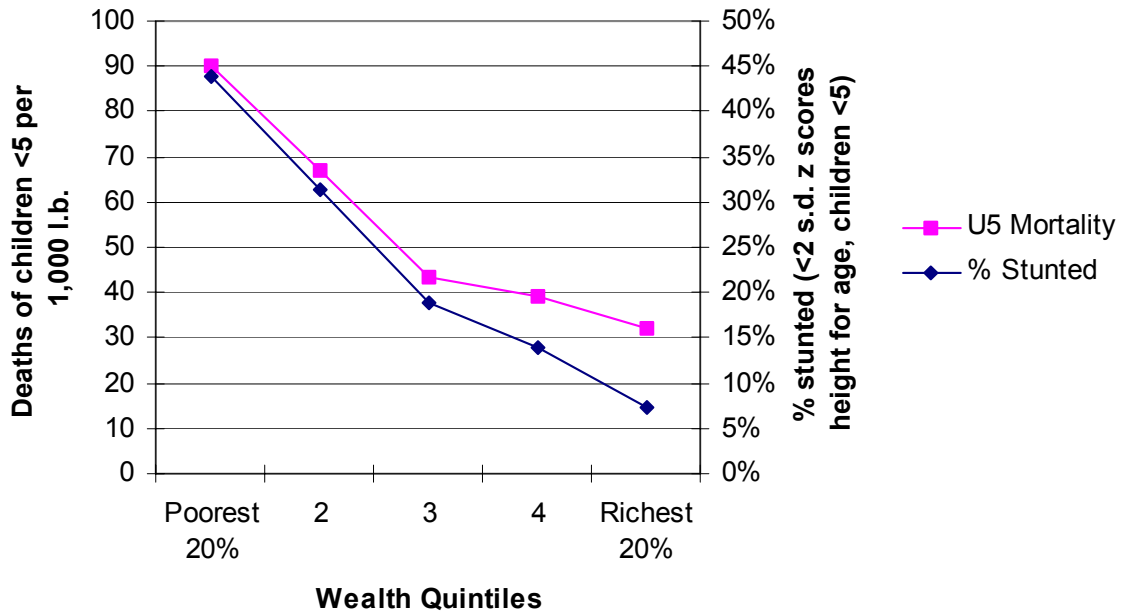
Inequality in Acute Respiratory Infection Prevalence



Source: Draft HNP/Poverty Fact Sheets. These are based on Demographic and Health Survey data, with wealth quintiles based on the Filmer Pritchett asset index.

Annex 2. Inequalities in health outcomes and access to services: Peru

Peru 1996 Health Outcomes



Peru 1996 Water Supply



Peru 1996 Toilet Facilities



Source: Health data based on HNP/Poverty Fact Sheets. Water and sanitation information using wealth quintiles composed by Deon Filmer using the Filmer Pritchett asset index. All based on Demographic and Health Survey data.