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# **Environmental Health Issues in Poverty Reduction Strategies**

**A Review**

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In 2001, the World Bank completed the comprehensive two-year process of preparing its Environment Strategy, *Making Sustainable Commitments: An Environment Strategy for the World Bank*. It was endorsed by the Bank's Board of Directors and published in October 2001. The Environment Strategy Paper series includes revised versions of background papers published during the Strategy preparation phase, as well as new reports prepared to facilitate implementation of the Strategy.

The Environment Strategy emphasizes the need to strengthen the analytical foundation of environmental work at the country level. Country environmental analysis (CEA) has been identified as one of the key environmental diagnostic tools for evaluating systematically the environmental priorities in client countries, the environmental implications of key policies, and countries' capacity to address their priorities. This report, together with two published papers on issues linked with country environmental analysis, has been prepared to provide guidance on institutional analysis to ongoing CEA concept development efforts.

The recommendations made in this paper represent the views of the authors and not those of the World Bank.



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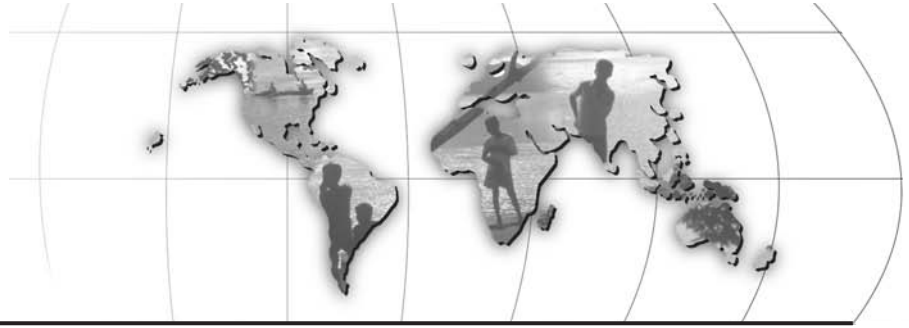
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## Executive Summary

**E**nvironmental health considerations refer to health risks associated with environmental factors. These risks fall into two broad categories: traditional hazards and modern hazards (Lvovsky 2001). Traditional hazards are related to poverty and lack of development, while modern hazards result from a lack of environmental safeguards and include problems arising from urban air pollution and agroindustrial chemicals and wastes. Health risks associated with lack of development, such as those stemming from poor drinking water supply, inadequate sanitation, and indoor air pollution, are severe and make up a large part of the burden of disease in most developing countries. These health risks affect the quality of life, leading to productivity losses, and hence can exacerbate the poverty spiral. Addressing such risks is critical to the development agenda in poor countries.

Poverty reduction strategy papers (PRSPs), which were introduced in the late 1990s, are prepared by countries eligible for assistance from the International Development Association (IDA) as a means of integrating sectoral priorities and poverty alleviation initiatives into the larger macroeconomic framework of development. PRSPs outline comprehensive

strategies covering a broad range of issues—in water, sanitation, health, energy, and education—that affect environmental health. They are central to the policy dialogue between donors, governments, and other stakeholders, including the World Bank.

The current review is an in-depth examination of the extent to which environmental health issues are incorporated in PRSPs. Its primary aim is to come to a better understanding of how environmental health issues and actions designed to tackle them are treated in PRSPs. In the process, the paper attempts to identify and highlight good practice examples that may be useful in honing future strategies.

The current assessment builds on previously published reviews of PRSPs (Bojö and Reddy 2002, 2003; Bojö and others 2004). In those reviews, 53 PRSPs were assessed according to 17 variables for environmental mainstreaming. The variables were grouped under four themes: Issues Identification, Causal Links Assessment, Response Systems, and Process. A set of 16 PRSPs that had received a score of 2.0 or higher on the environmental health variable (under Causal Links Assessment) in Bojö and others (2004) was selected for this

analysis, which differs from its predecessors in that it reviews more exhaustively aspects relating to environmental health under the four established themes.

*Issues Identification* refers to the identification of priority environmental issues associated with environmental health risks. For *Causal Links Assessment*, the review focuses on whether environmental health is identified as an important link between poverty and environment. Analysis of the Issues Identification and Causal Links Assessment themes is more meaningful if appropriate environmental health interventions are followed through; these are captured under *Response Systems*. Under *Process*, the review examines the extent to which PRSPs identify vulnerable groups affected by environmental health concerns and assesses the level of intersectoral coordination between ministries in implementing strategies and programs.

Using a similar methodology as in the previous reviews, each variable listed under the four themes is ranked on a scale of 1 to 3, and an unweighted average is calculated. In addition, a short case study on Ghana showcases the extent to which intentions highlighted in the country's PRSP are followed through with actions in the poverty reduction support credit (PRSC).

The discussion of environmental health in this review focuses on increased health risks associated with a wide range of environmental factors. These factors include

- Poor access to potable water
- Lack of sanitation
- Water pollution in populated areas
- Effluent discharge from industrial and agricultural waste

- Food contamination through pathogens
- Indoor air pollution from cooking and heating using coal and biomass fuel
- Urban air pollution from motor vehicles, thermal (coal) power stations, and industry
- Poor solid waste disposal
- Pesticides and agricultural runoff.

An initial screening showed that in the selected PRSPs minimal importance was attached to toxic chemicals, industrial effluents, and agricultural runoff. Accordingly, the review focuses on environmental health issues linked with water and air, the two environmental media identified in all 16 PRSPs. The PRSPs are also reviewed for mentions of vector-borne diseases, which are exacerbated or contained by certain infrastructural or environmental changes affecting the vector's habitat.

The overall findings of the review are as follows:

- The average score obtained for assessing environmental health in PRSPs is 2.0, on a scale of 1 to 3. The sample chosen was thought to hold the promise of good practice examples that could be highlighted and analyzed in depth. The average score of 2.0 lends some credibility to this premise.
- Average scores across the reviewed PRSPs range from 1.3 to 2.4, showing the varying extent to which environmental health issues receive attention in the sample.
- Issues Identification, which covers the extent to which environmental conditions associated with increased health risks are diagnosed in the PRSPs, is the weakest of the four themes, with an average score of only 1.5 for the sample.
- Countries in the sample with high average scores include Djibouti, Ghana, the Repub-

lic of Yemen, and Zambia. Examples of best practice are drawn from these and other countries, since additional best practice examples are found under each theme.

The main conclusions on environmental health in PRSPs can be outlined as follows:

*Environmental health is not systematically addressed in PRSPs.* The discussion of environmental health in the sample remains weak and tells only a partial story. There is a disconnect, given the fragmented discussion of environmental health across the four themes.

*Water and sanitation receive more attention than environmental health concerns related to air and energy.* Water and sanitation issues occupy the most significant place under environmental health across all themes. Air pollution—related issues, linked primarily to respiratory disease, are in a distant second place. Water and sanitation programs and projects are directly focused on achieving better environmental health outcomes through improved water quality, water access, and sanitation, while air pollution abatement and energy-related responses often focus more on energy efficiency than on environmental health.

*Sanitation remains secondary to water supply.* Although sanitation is identified in PRSPs as critical to the incidence of diseases such as diarrhea, it is usually addressed as an adjunct to water supply. Access to basic water supply is indeed vital in tackling environmental health problems, but improved sanitation and hygiene have an equally important role, which needs to be highlighted better in PRSPs.

*There is scope for enhancing already existing measures to maximize health outcomes.* In

several instances, responses that could reduce environmental health risks are identified without a clear delineation of critical issues or links between the associated environmental factors and human health. These responses are classified as *indirect responses*. If environmental health benefits are not taken into account in a strategy, indirect responses represent missed opportunities. Countries must capture these missed opportunities by effectively ensuring that, where possible, responses yield multiple benefits. Countries can draw on various resources to help strengthen their understanding of environmental health issues, streamline responses, and focus on achieving environmental health outcomes. Finally there is a need to address the irregularity of data and the unreliability of information on environmental health issues which are reflected in PRSPs, primarily through stronger public health surveillance systems.

*Forward movement on environmental health requires clarification of ownership.* PRSPs often are not clear in assigning responsibilities within the public sector for actions to improve environmental health outcomes. What makes an environmental health program difficult to implement is its cross-cutting, multisectoral nature. *Intentions* highlighted in PRSPs have to be followed through by *actions*, which are facilitated by clear assignment of responsibilities.

This is particularly important since environmental health outcomes cannot be achieved solely by encouraging measures in the health sector or by finding solutions to environmental degradation issues. What is required is a holistic strategic approach in which environmental protection, infrastructure development, institutional strengthening and accountability,

health services, and education and outreach programs are combined so as to systematically improve environmental health outcomes over time.

The review does identify several instances of good practice, illustrating that there are

examples to build on and learn from. Poor health associated with environmental factors is a dimension of poverty and one that is crucial to address in PRSPs. This review points to the clear scope for improvement in better addressing environmental health issues in poverty reduction strategies.



## Chapter 1

# Context and Background

**E**nvironmental health issues are critical concerns for all developing countries. They are closely tied to a variety of activities in multiple sectors, including infrastructure, transport, industry, energy, and agriculture. Environmental health considerations refer to health risks associated with environmental factors and fall into two broad categories: traditional hazards and modern hazards (Lvovsky 2001). Traditional hazards are closely linked to poverty and lack of development. Most vulnerable to these risks are poor people, who suffer the consequences of lack of access to clean water, inadequate sanitation, poor waste disposal, indoor air pollution, and vector-borne diseases such as malaria. Modern hazards include urban air pollution and problems arising from agroindustrial chemicals and wastes. Although this study's initial focus is on both traditional and modern hazards, the importance accorded to traditional hazards in poverty reduction strategies, which is evident from the results of this study, clearly demonstrates their priority status.

Critical linkages exist between poverty, environmental degradation, and health concerns (World Bank 2001). Health impacts clearly exacerbate the poverty spiral (Lvovsky 2001).

At a macro level, developmental challenges and lack of safeguards can result in health effects that invariably lead to productivity losses. These can be quantified as economic losses at the national level.<sup>1</sup> Productivity losses vary, given the differentiated health risks. Environmental risk factors are responsible for almost 21 percent of the global burden of disease worldwide. The two problems contributing most to the environmental burden of disease in developing countries are unsafe water and sanitation, and indoor air pollution (WHO 2002).

Unsafe water, lack of sanitation, and inadequate hygiene are leading environmental risk factors in the burden of disease (Kaufmann 2005). Among the well-known health consequences of the water and sanitation problem are the 4 billion cases of diarrhea worldwide per year and the 2.2 million deaths, mostly among children under age five, from this cause (WHO 2004). Globally, about 1.1 billion people lack access to safe drinking water, and 2.6 billion are without adequate sanitation.

The water and sanitation risk factor is closely followed by indoor air pollution, a much less publicized source of ill health that is nevertheless responsible for over 1.6 million deaths

per year. Men suffer more from outdoor pollution, and women are exposed more to indoor air pollution, but for both risk factors most of the toll of death and disease falls on children under age five (Leitner 2005). Indoor air pollution is responsible for 2.7 percent of the global burden of disease. More important, children under age five account for more than 50 percent of deaths attributable to indoor use of solid fuel. It is estimated that nearly half of the world's population still uses solid fuel (biomass and coal) for household cooking and space heating, mainly in developing countries.

Poverty-stricken areas—notably, Sub-Saharan Africa, followed by South Asia—face many challenges that link poverty, environment, and health. Sub-Saharan Africa has 10 percent of the global population, but in 2000 it accounted for 27 percent of the entire global burden of disease (Lvovsky 2001). Next is India, the world's second most populous country, with almost one-fifth of the global burden of disease.

Health can be significantly improved by mitigating environmental degradation, alleviating poverty, and strengthening development outcomes. Income benefits can accrue from improved environmental conditions, such as better water quality. These benefits result from a reduction in the cost of health treatment and from gains in productivity. For example, easier access to clean water and to sanitation facilities leads to increased productivity because of time saved in collecting water and because of a decline in water- and sanitation-related illnesses. The incidence of diarrhea in children—one of the main causes of infant and child mortality in Africa and South Asia—can be lowered through these efforts. Indoor air pollution can be reduced by increased access

to and use of cleaner fuels, use of improved stoves, better ventilation, and rural development initiatives that focus on educating people about potential health risks. Vector-borne diseases such as malaria can be controlled through better drainage and distribution of bed nets in rural areas. Focusing strategies so as to address environmental health concerns is therefore of critical importance.

## POVERTY REDUCTION STRATEGY PAPERS

Poverty reduction strategy papers (PRSPs), which were introduced in the late 1990s, are prepared by countries eligible for IDA assistance as a means of integrating sectoral priorities and poverty alleviation initiatives into the larger macroeconomic framework for development.<sup>2</sup> PRSPs are country-owned and results-oriented documents that provide guidelines and direction for countries as they endeavor to utilize foreign assistance for domestic priorities aimed at reducing poverty. The World Bank's lending and nonlending activities are directly influenced by the country priorities identified in PRSPs. PRSPs outline comprehensive strategies covering a broad range of issues—in water, sanitation, health, energy, and education—that affect environmental health. These strategies are often developed through input from individual sectoral ministries and other actors. Because both environment and health are cross-sectoral, and clear directions for multisectoral dimensions remain weak, critical environmental health issues can fall through the cracks in development strategies and between the mandates of development agencies (Lvovsky 2001). Even in the World Bank's country assistance strategies (CASs), environmental health concerns are reflected weakly (Kishore and Shyamsundar 2005).

PRSPs are central to the policy dialogue between donors, governments, and other stakeholders, including the World Bank. In order to get a clearer picture of how PRSPs deal with environmental health concerns, this study undertakes an in-depth review to ascertain the extent to which environmental health concerns are incorporated in PRSPs. The main aim of the review is to come to a better understanding of how environmental health issues and actions designed to tackle them are treated in PRSPs. In the process, the paper attempts to identify and highlight good practice examples that may be useful in honing future strategies.

## BUILDING ON EARLIER REVIEWS

The current assessment builds on previously published reviews of PRSPs (Bojö and Reddy 2002, 2003; Bojö and others 2004). In these reviews, 53 PRSPs were assessed according to 17 variables related to environmental mainstreaming. The variables were grouped under four themes: Issues Identification, Causal Links Assessment, Response Systems, and Process (box 1). The same broad themes are analyzed in the current review. *Issues Identification* focuses on the diagnosis of priority environmental concerns and opportunities in PRSPs. *Causal Links Assessment* analyzes multiple poverty-environment linkages; environmental health is one of the variables under this theme. *Response Systems* covers proposals for environmental management capacity, investments in natural resources and human-made capital, and monitoring of targets and indicators. Finally, *Process* captures approaches used to promote the inclusion of environmental constituencies and an environmental agenda. Each variable within the four themes is ranked on a scale of 1 to 3, and an unweighted average is calculated on the basis of these ratings. This

average score highlights the extent of environmental mainstreaming achieved in PRSPs.

A set of 16 PRSPs that scored 2.0 or higher on the environmental health variable in Bojö and others (2004) was selected for this study, which analyzes more exhaustively aspects relating to environmental health across the four themes. The difference between this study and Bojö and others (2004) is that in the earlier study environmental health was reviewed as an isolated variable, while in the current review its linkages with the four themes are analyzed in greater detail.

Specific variables relevant to environmental health are selected under each theme and are

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### BOX 1 Themes and variables assessed in environmental mainstreaming

#### *Issues Identification*

- Land use
- Water
- Air and climate
- Biodiversity

#### *Causal Links Assessment*

- Poverty and natural resource degradation
- Environmental health
- Vulnerability
- Property rights
- Incentives
- Empowerment
- Gender

#### *Response Systems*

- Environmental management capacity
- Investment in natural capital
- Investment in human-made capital
- Monitoring of natural resources outcomes
- Monitoring of human resources outcomes

#### *Process*

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Source: Bojö and others 2004.

ranked on the basis of the same methodology used in the earlier reviews. Details on the selection of these variables and the methodology

for scoring environmental health are discussed in the next chapter.



## Chapter 2

# Environmental Health Aspects in PRSPs

**T**his chapter discusses in greater detail the methodology used in analyzing environmental health aspects in PRSPs and summarizes the main findings of the review.

## METHODOLOGY

The framework for assessment used for this study builds on the previous reviews on environmental mainstreaming in PRSPs (Bojö and Reddy 2002, 2003; Bojö and others 2004). Sixteen PRSPs that had scored 2.0 or higher on the environmental health variable in Bojö and others (2004) were selected for analysis. Using a similar methodology as in the earlier reviews, each variable is ranked on a scale of 1 to 3, and an unweighted average score is calculated. This unweighted average score enables a comparison of each of the 16 PRSPs on a scale of 1 to 3, based on the relative performance of its variables. The variables identified for the current study, listed across the four themes, are:

1. Issues Identification
  - Water
  - Air and climate
2. Causal Links Assessment
  - Environmental health

3. Response Systems
  - Environmental management capacity
  - Investment in human-made capital
  - Monitoring of human resources outcomes
4. Process

Where a rank is:

- 0 = no mention
- 1 = mentioned but not elaborated
- 2 = elaborated
- 3 = good practice

A score of 3 simply means “good practice” within the set of PRSPs being reviewed; it does not in any way signify an absolute best. Across the sample, PRSPs may tackle similar issues with varying degrees of detail, and “good practice” highlights those examples that provide a certain level of detail and analysis on a particular issue.

It should be noted that this review included all PRSPs that were available as of June 30, 2004. The current review was also extended to include subsequent country PRSP progress reports and poverty reduction support credits (PRSCs) that were available as of June 30, 2005, to assess the progress made in carrying out the intentions for environmental health

stated in the PRSPs. The appendix lists the documents reviewed. Since the sample of progress reports and PRSC documents was very small and a preliminary screening revealed that they contained either little information on environmental health or the same information as in the PRSPs, these documents were not assessed using the methodology described above. A case study on Ghana does, however, showcase the extent to which intentions highlighted in the PRSP are followed through in actions in a country's PRSC.

## SCOPE AND LIMITATIONS

In the current review, environmental health focuses on increased health risks associated with a wide range of environmental factors. These factors include

- Poor access to potable water
- Lack of sanitation
- Water pollution in populated areas
- Effluent discharge from industrial and agricultural waste
- Food contamination through pathogens
- Indoor air pollution from cooking and heating using coal and biomass fuel
- Urban air pollution from motor vehicles, thermal (coal) power stations, and industry
- Poor solid waste disposal
- Pesticides and agricultural runoff.

An initial screening showed that minimal importance was accorded to toxic chemicals, industrial effluents, and agricultural runoff in PRSPs. Accordingly, the review focuses on the two important environmental media identified in the 16 PRSPs: water and air. The PRSPs are also reviewed for mention of vector-borne diseases, which are exacerbated or contained by certain infrastructural or environmental

changes that affect the vector's habitat and so influence the spread of a disease. Malaria is a recurrent subject and is referred to as a vector-borne disease in almost all the PRSPs reviewed.

In the current review, Response Systems are defined broadly enough to include both the direct and the indirect interventions for environmental health in PRSPs, in order to ensure that all policy interventions and programs that have spillover effects on environmental health are captured. Direct interventions are defined as those responses that address identified environmental health risks and focus specifically on reducing them, while indirect interventions include the entire large gamut of responses that are geared first of all toward improving environmental conditions or increasing access to infrastructure services but that could also potentially reduce environmental health risks.

Since the current sample consists of PRSPs that ranked 2.0 or higher on environmental health in the previous review, it is inherently biased. This limitation implies that the results of the assessment are relevant only for the sample of 16 PRSPs reviewed and cannot be generalized across all PRSPs. Nevertheless, the review does highlight some critical policy implications that can have a significant bearing on how environmental health considerations are integrated into future poverty reduction strategies.

Another limitation of the study is related to the contextual bias. Like the previous review of PRSPs, this study does not take country-specific realities into account. It compares all PRSPs in the sample against an established threshold (average score of the sample) without accounting for contextual differences between coun-

tries.<sup>3</sup> For example, if a country scores low on environmental health, the reason may be that environmental risks are in fact low, but we have no way of qualifying that. Arguing against such an assumption is the strong evidence pointing to high environmental health risks arising from lack of development and poor environmental conditions in many countries in the subset reviewed. With Africa lagging grossly behind the world average in access to basic services and cleaner fuels and in vulnerability to natural disasters, the low scores of Sub-Saharan African countries in the sample are probably not attributable to inherently low environmental health risks but to a lack of attention to these risks or a poor level of awareness in PRSPs.

Finally, the current review is a desk study of PRSP documents and has the expected limitations of such reviews. The scale and scope of issues and interventions identified in these documents have to be viewed as stated intentions that may or may not reflect the real situation.

## SELECTION OF VARIABLES: WHAT IS RELEVANT FOR ENVIRONMENTAL HEALTH?

Under each theme, specific variables relevant to environmental health are identified. The assessment looks at traditional and modern environmental hazards but focuses especially on environmental health issues related to water and air.

### Issues Identification

The theme Issues Identification refers to the identification of priority environmental issues that result in environmental health risks.<sup>4</sup> The

main question is: Does the PRSP identify environmental factors that potentially increase specific health risks? The review looked primarily at issues related to water and sanitation and to air pollution and, secondarily, at the extent to which electrification is highlighted in PRSPs.

*Water:* The focus is on whether the PRSPs discuss issues relating to diagnosis of the quantity and quality of water supply for human consumption, the extent of water pollution and exposure, access to sanitation, waste disposal, water scarcity, and intraregional disparities in water availability.

*Air:* The focus is on whether the PRSPs capture issues relating to sources of energy used by rural and urban households; indoor pollution (from burning of coal and biomass fuels) and outdoor pollution (including lead, particulate matter, sulfur, and nitrogen oxide from industrial processes and transport systems); and electrification.

### Causal Links Assessment

For the theme Causal Links Assessment, the review asks: Is environmental health identified in the PRSPs as an important link between poverty and environment? In Bojő and others (2004) this theme captures (a) whether poverty leads to environmental degradation, and (b) whether environmental degradation is hurting the poor. Poverty and environment are inextricably linked, and the burden of disease in most developing countries is strongly associated with environmental factors. Poor people are susceptible to environmental health risks resulting from lack of development. In this context, the environmental

health link variable captures the association of low levels of development with the incidence of certain diseases—for example, respiratory disease tied to indoor or outdoor pollution, and diarrhea and other waterborne diseases linked to lack of potable water or to poor sanitation.

The environmental health variable was the only variable under the Causal Links Assessment theme in Bojö and others (2004) to be used for this study. The score received by the environmental health variable is carried over from earlier studies on environmental mainstreaming.

### Response Systems

A discussion of Issues Identification and Causal Links Assessment is more meaningful if appropriate environmental health responses are identified and followed through. Here the main question is: Are medium-to-long-term strategies for environmental health clearly identified, along with monitorable actions that have specific time lines and allocated resource envelopes? The review focuses on the identification of appropriate environmental management capacity, which includes policies and regulatory mechanisms that can address environmental health concerns in PRSPs. PRSPs were also reviewed to identify specific time-bound and costed investment programs that can help curb pollution levels or increase access to basic services and that are geared toward improving environmental health outcomes. Policies that directly and indirectly have an impact on environmental health issues are reviewed under this theme. Responses designed to address environmental health issues are captured under the three variables described below.

#### *Environmental management capacity.*

The review assesses the extent to which PRSPs identify country regulations, policies, and legislation for water and air pollution abatement, including environmental standards, data and information systems, institutional capacity building, and enforcement capabilities.

*Investment in human-made capital.* The assessment focuses on whether the PRSP discusses programs relating to water supply and sanitation, wastewater treatment, waste management, improved stoves, transport infrastructure, electrification, and urban and rural infrastructure investments that could potentially reduce environmental health risks.<sup>5</sup>

*Monitoring of human resources outcomes.* Indicators and targets are important for monitoring progress toward human resources outcomes such as human health. The review focuses on both physical and health indicators. Health indicators include infant mortality, under-five child mortality, and morbidity. A strong health surveillance system is crucial. Physical indicators include the percentage of the population with access to safe water and adequate sanitation; energy demand and electricity coverage in rural and urban areas; air quality indicators, including particulate (PM<sub>10</sub>) concentrations; and the burden of disease from air and water pollution.

### Process

The definition of Process used here has been altered slightly from that in the earlier review

to correspond to the focus on environmental health, which cuts across sectors.

The question here is: Does the PRSP take a multisectoral approach to implementation at all levels—national and local—to mitigate environmental health risks in order to improve conditions for the poor, who are particularly vulnerable? Under the Process theme, the assessment focuses on the extent to which vulnerable groups affected by environmental health concerns are identified. In addition, the review assesses intersectoral coordination between ministries and the degree of institutional governance in implementing strategies and programs. Since this is a desk study, there is no way to gauge how these issues are actually integrated or the effectiveness of the strategies.

The study simply examines how the two issues under Process are treated in the text of the PRSPs.

## ENVIRONMENTAL HEALTH LINKAGES IN PRSPs

Table 1 summarizes how the PRSPs reviewed scored on the four themes. Of the 16 PRSPs analyzed, 9 are from Africa, 2 from the Middle East and North Africa, 3 from Eastern Europe and Central Asia, and 2 from East Asia. The average score for assessing environmental health links in PRSPs is 2.0 on a scale of 1 to 3. This score provides a rudimentary indicator of the level of attention received by environmental health considerations in the PRSPs reviewed.

**Table 1 Integration of environmental health considerations in PRSPs, ranked by overall score**

Country	Region	Overall score	Issues Identification	Causal Links Assessment	Response Systems	Process
Ghana	AFR	2.6	2.0	3.0	2.7	3.0
Djibouti	MNA	2.6	2.5	3.0	2.7	2.0
Zambia	AFR	2.4	1.5	2.0	3.0	3.0
Yemen, Republic of	MNA	2.3	2.0	3.0	2.3	2.0
Chad	AFR	2.1	1.5	2.0	2.3	3.0
Malawi	AFR	2.1	2.0	2.0	2.7	1.0
Cambodia	EAP	2.1	1.5	2.0	2.7	2.0
Serbia and Montenegro	ECA	2.0	2.0	2.0	2.0	2.0
Azerbaijan	ECA	2.0	1.5	2.0	2.3	2.0
Mongolia	EAP	1.9	2.0	2.0	1.7	2.0
Senegal	AFR	1.9	1.0	2.0	2.3	2.0
Guinea	AFR	1.7	1.0	2.0	2.3	1.0
Burundi (interim PRSP)	AFR	1.7	1.0	3.0	1.7	2.0
Rwanda	AFR	1.6	1.0	2.0	1.7	2.0
Kyrgyz Republic	ECA	1.4	1.0	2.0	1.3	2.0
Ethiopia	AFR	1.3	1.0	2.0	2.0	0
Average		2.0	1.5	2.3	2.2	1.9

Note: AFR, Sub-Saharan Africa; ECA, Eastern Europe and Central Asia; MNA, Middle East and North Africa.

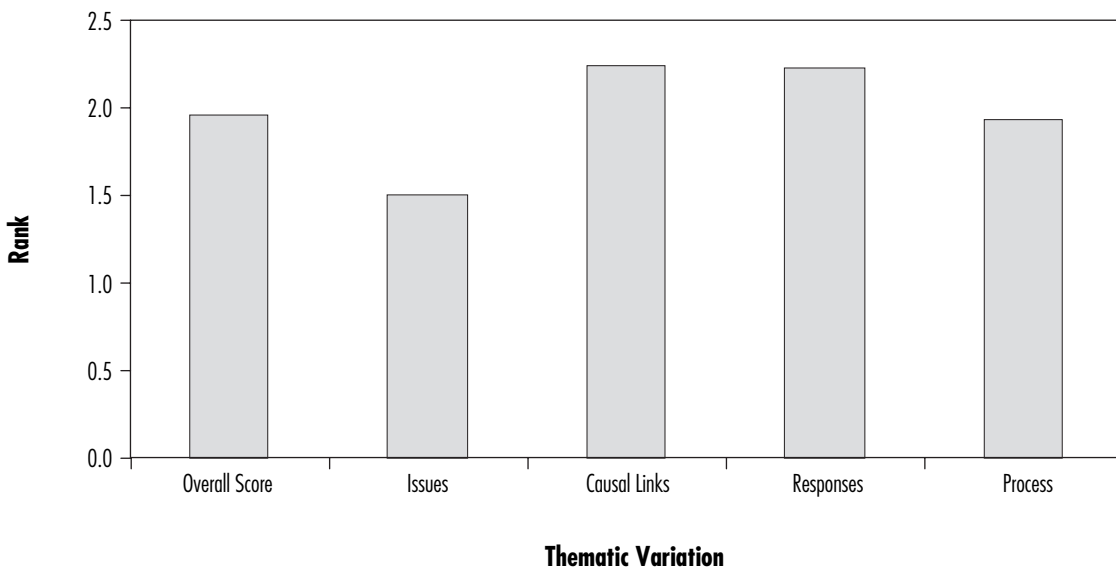
The sample identified for the review was preselected so as to hold some promise of instances of good practice in environmental health issues in PRSPs and allow an in-depth analysis of these examples. The average score of 2.0 provides some corroboration for that assumption. Air- and water-related environmental health issues are those most often addressed in the sample reviewed. These results cannot be generalized across all PRSPs, given the selection bias in the set of 16 PRSPs. Another caveat is that the average score includes responses articulating interventions which address environmental health considerations indirectly as well as directly, and this bolsters the emphasis on environmental health issues in PRSPs. The detailed analysis in chapter 3 outlines the main trends in consideration of environmental health issues across the four themes and enables greater understanding of particular areas of weakness and strength.

The variation is considerable, with average scores ranging from 1.3 to 2.6. As seen in figure 1, the Causal Links Assessment average

score, which was carried over from the previous review, is 2.3; next highest is Responses, with 2.2. Establishing causal links is important for identifying the connections between prevailing environmental conditions and increased health risks. For example, poor-quality drinking water significantly increases the risk of diarrheal disease in children, and indoor air pollution can lead to a higher risk of respiratory disease in women and young children, who are typically at home when cooking is going on. In the current review, Responses identified for environmental health concerns and Causal Links established between health and environmental conditions are well integrated into PRSPs, but the extent to which the corresponding environmental conditions associated with increased health risks are diagnosed in the PRSPs under Issues Identification remains very weak, as shown by a score of 1.5.

The regional summaries presented in table 2 should be interpreted with caution and should not be extrapolated to form general conclusions beyond the small sample of PRSPs

**Figure 1 PRSP ranking by theme**



**Table 2 Regional variation in PRSPs**

Region	Number of countries	Overall score	Issues Identification	Causal Links Assessment	Response Systems	Process
MNA	2	2.5	2.3	3.0	2.5	2.0
ECA	3	1.8	1.5	2.0	1.9	2.0
EAP	2	2.0	1.8	2.0	2.2	2.0
AFR	9	1.9	1.3	2.2	2.3	1.9
Total	16	2.0	1.5	2.3	2.2	1.9

Note: AFR, Sub-Saharan Africa; EAP, East Asia and Pacific; ECA, Eastern Europe and Central Asia; MNA, Middle East and North Africa.

reviewed. In the current sample, the average scores for countries in the Middle East and North Africa are consistently higher across all themes than those for other regions, but high-scoring countries such as Cambodia, Ghana, and Zambia are also found in other regions. Examples of best practice come from these and other PRSPs. Under Causal Links Assessment,

the Middle East and North Africa region had the highest score of 3.0. Issues Identification is weak for all regions except the Middle East and North Africa.

Building on these results, chapter 3 analyzes in greater detail the four themes and the variables identified under each.





## Chapter 3

# Thematic Variability in Environmental Health Concerns

**T**his chapter discusses variability in the discussion of environmental health issues in PRSPs under the four themes: Issues Identification, Causal Links Assessment, Response Systems, and Process. Each theme captures specific variables that are relevant for environmental health. The discussion here covers the extent to which these issues are explored in PRSPs and provides examples of good practice under each theme.

### ISSUES IDENTIFICATION

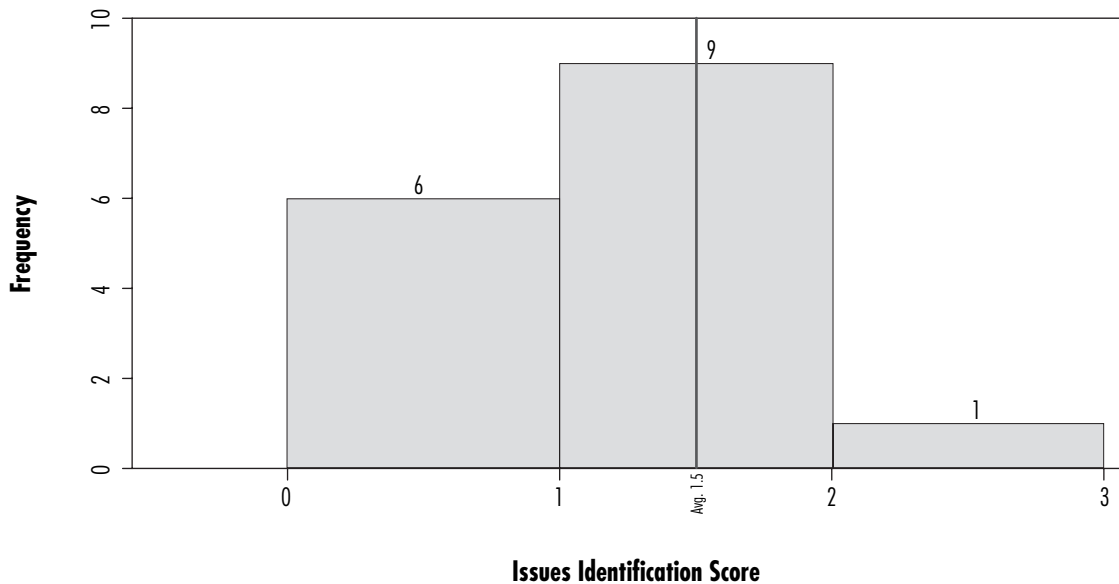
The review focuses on the specific description and diagnosis of environmental priorities that link with health. For water, the theme Issues Identification captures the sources of polluted water, water quality, water scarcity, access to safe water in urban and rural populations, and sanitation issues. For air- and energy-related issues, it covers energy sources used by rural and urban populations, mobile and stationary sources of outdoor air pollution, indoor air pollution, and ambient air quality levels.

Identification of the underlying environmental factors that lead to health risks is the weakest theme in the review of PRSPs, with a score of 1.5 (figure 2). The average score among the 16

PRSPs varies widely, from 1.0 to 2.5, and only one PRSP scored more than 2.0 on this theme. In the scoring, the idea was to focus as much as possible on isolating the underlying diagnostic environmental factors that affect health. Good practice PRSPs are identified in table 3. The scores awarded under Issues Identification are independent of whether the variables (water and air) are actually tied to health in the PRSP; the link to environmental health is taken up under the theme Causal Links Assessment.

*Water.* Water issues are well mainstreamed and highlighted in all the PRSPs, and all of the reports mention serious problems with access to and availability of potable water. The disparities in access to water, both by geographic area and by standard of living, are associated with four major constraints: insufficient quantity; problems with quality; inadequacies in and unsustainability of delivery of potable water and management of wastewater systems; and affordability. The diagnosis of these issues varies in the PRSPs. The reports identify those aspects that clearly have priority in the particular country. An important point is that the diagnosis of issues relating to water supply received the most attention among environmental factors affecting health.

**Figure 2 Issues Identification: Distribution of scores**



The Djibouti PRSP described in box 2 receives a score of 3.0 (good practice) for its discussion of water issues and sanitation. Its overall average score for Issues Identification was 2.5, the highest score for this theme among the 16 PRSPs reviewed.

The Republic of Yemen PRSP is another good practice example, with a score of 3.0 on water issues. The paper analyzes the critical state of the country’s water resources, which results from excessive mining of underground water, insufficient recharge of aquifers, and pollution of underground water by wastes from garbage dumps and by wastewater that is returned to underground basins in some oil extraction operations.

The Serbia and Montenegro PRSP is the only one to provide details on the quality of piped water. Nevertheless, that PRSP receives a middling score of 2.0 on water issues because it does not include details on affordability, the state of water resources, or consumption levels

in the country. The PRSP cites findings of the Public Health Institute of the Republic of Serbia showing that 29 percent of samples from water supply systems failed to satisfy physical, chemical, or bacteriological standards in 2001. More than 40 percent of samples from central Serbia were contaminated and did not satisfy quality criteria. Only Belgrade was identified as having adequate water quality, with more than 90 percent of samples meeting quality standards.

The review of the 16 PRSPs suggests that access to piped water is usually higher in urban areas than in rural areas. For example, the Ghana PRSP notes that only 18.8 percent of the rural population has access to piped water, compared with 80.8 percent of the urban population. According to the PRSP, a majority of the rural population depends on wells and natural sources that are polluted, leading to waterborne diseases.

Although several PRSPs identify critical aspects relating to water access, quality, and afford-

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**BOX 2****Djibouti PRSP: Identifying water issues**

The Djibouti PRSP provides a striking example of analysis of the state of water resources. It highlights problems of scarcity, access, consumption, quality, and affordability—all issues that are relevant to and have repercussions for environmental health.

**Scarce water resources**

The PRSP notes that Djibouti has limited access to surface water resources. Underground water abstraction supplies more than 95 percent of the country's water consumption. Recharge of underground water tables is limited (5 percent of precipitation), and population growth, urban development, and the development of agropastoral activities have caused intensive exploitation of underground water in the past several decades. Water table levels and quality have declined as a result, and water is unfit for consumption unless treated.

**Access**

Freshwater consumption in Djibouti is currently rising by 20 million to 22 million cubic meters per year. Of this, 16 million cubic meters are distributed in the main urban centers and 5 million to 7 million cubic meters in rural areas. An estimate of urban and rural water needs states that Djibouti is experiencing a water shortage of between 5 million and 7 million cubic meters per year. (The term *water shortage* is used to describe an absolute shortage whereby levels of available water do not meet certain defined minimum requirements. The actual quantity that determines a per capita minimum may differ from place to place.)

According to the PRSP, 15.9 percent of the population lacks access to an improved water source. The proportion is generally low in Djibouti City (less than 7.4 percent). In rural areas 49.1 percent do not have access to an improved drinking water source.

Water supply varies from one area to another, according to the PRSP. In Djibouti City, although most households are connected to the water system, nearly 48 percent of households are supplied through pipes hooked up at the homes of neighbors, reflecting the huge disorganization in water distribution and marketing, as well as numerous institutional and management problems with ONED, a public operator. A large proportion of households in the first (poorest) and second quintiles receive water from public fountains and/or from tank trucks. In the other urban centers, supply from public fountains is the dominant method. In rural areas nearly 30 percent of households draw on traditional wells that are in poor hygienic condition.

**Consumption**

Average water consumption is estimated at 102 liters per day per person, but in Djibouti City it ranges from only 15 liters for households in the first quintile to 344 liters for those in the fifth quintile. Similar disparities prevail in other urban centers and in rural sedentary areas. In rural and semiurban areas, only 60.8 percent of the demand from people, agriculture, and cattle is met.

**Water quality**

A deficit in water quantity is accompanied by poor water quality. The PRSP observes that the salinity rate has been well above the normal tolerance levels set by the World Health Organization (WHO), with 830 milligrams per liter of chloride and a conductivity of 2,900 microsiemens per centimeter ( $\mu\text{S}/\text{cm}$ ). Water available from drilled holes registers temperatures higher than 40°C. According to the PRSP, quality shortcomings have repercussions on health and also slow development of agriculture and cattle farming.

**Affordability**

Water is expensive for the poor urban population. In Djibouti water tank trucks account for a significant portion (11 percent) of the water supply in poor districts. According to the PRSP, "in these areas, water is delivered by tanker trucks, at a price reaching eight times the price of the first slice of consumption from ONED's tariffs." The PRSP notes that poor households, particularly in Djibouti City, pay, on average, two to three times more for water than do nonpoor households because of the high price of water from tank trucks.

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ability, the review finds a pronounced lack of reliable data in PRSPs. The Chad PRSP, for example, gives percentage figures for household access to a “piped network” but then raises the question of how much water is actually supplied, given a nonfunctioning network. Similar examples can be found in other PRSPs, including that for Ghana.

*Sanitation.* Sanitation levels in any country are a key link in the cycle of disease and poverty, which affects the most marginalized sections of the population. There are several constraints on demand for sanitation in developing countries. These include lack of information concerning sanitation and its impact on waterborne disease cycles; misinformation; and even a historical ambivalence regarding the unavailability of sanitation facilities.

This review finds that in PRSPs sanitation is treated as secondary to water supply. There is usually some discussion on access to sanitation facilities from poor and nonpoor perspectives. The Chad PRSP, for example, states that “less than two percent of the inhabitants of towns and cities have lavatories with running water while latrines are practically nonexistent in rural areas.” Interestingly, although diagnosis of sanitation issues is weak, most PRSPs in the sample that refer to water and

sanitation highlight the critical importance of hygiene and sanitation in battling waterborne disease.

*Air pollution and energy use.* Energy use can contribute to air pollution, which can have a severe impact on respiratory health. The use of fuelwood and charcoal for cooking leads to indoor air pollution, including high levels of particulate matter, and this affects the respiratory health of, primarily, women and young children. Outdoor air pollution from mobile and industrial sources in densely populated urban areas also increases health risks for all ages.

Under the Issues Identification theme, PRSPs were examined for their identification of the main sources of air pollution and levels of air quality. The review also covers an assessment of the prevailing status of rural and urban electrification as highlighted in the PRSPs. The inclusion of electrification in the review captures to some extent the substitution effect of moving from more polluting fuels to cleaner fuels.<sup>6</sup>

Air pollution receives some attention in the PRSPs. The prevailing discussion of rural and urban electrification in PRSPs merits a minimal score of 0 or 1.0 under this variable. No

**Table 3. Issues Identification: Good practice examples**

Issue	Good practice PRSPs
<b>Water</b>	
State of water resources	Djibouti, Mongolia, Republic of Yemen
Access issues	Djibouti, Ghana, Malawi
Consumption	Djibouti, Mongolia, Republic of Yemen
Quality	Djibouti, Ghana, Mongolia, Republic of Yemen
Affordability	Djibouti, Republic of Yemen
<b>Sewage and waste management and sanitation</b>	Djibouti, Ghana, Malawi, Mongolia, Republic of Yemen

**Table 4. Issues Identification: Air pollution and energy use**

Issue	Peripheral discussion
<b>Air pollution and energy use</b> <i>Some PRSPs mention and highlight the following issues:</i>	No good practice examples exist.
Energy sources and solid fuel use	Djibouti, Ghana, Malawi, Mongolia
Indoor air pollution	Mongolia
Outdoor air pollution	Azerbaijan, Serbia and Montenegro
Ambient air quality	Serbia and Montenegro
Mobile sources	Azerbaijan, Serbia and Montenegro
Industrial sources	Azerbaijan, Serbia and Montenegro
Electrification	Chad, Ghana, Malawi

PRSP received a score of 3.0 (good practice) on air pollution and energy use, for reasons noted below. Djibouti, Malawi, Mongolia, and Serbia and Montenegro received a score of 2.0, but all other PRSPs scored 1.0 or 0 on this variable. The PRSPs that undertook some peripheral discussion of issues relating to air and energy use are listed in table 4.

The review finds that the discussion of the use of solid fuels and of pollution levels from mobile and stationary sources is very limited. Fragmented discussion of some of these issues does occur. One example is the Mongolia PRSP, which scored 2.0 on air pollution and energy use and had an overall average of 2.0 for Issues Identification. That PRSP refers to air pollution from coal and wood burning, stating that “in Ulaanbaatar city, 75 thousand households in *ger* [houses] use 200 thousand tons of coal and 1600 thousand cubic meters of wood for fire per year. The ash along with the smoke . . . results from burning coal and firewood.” Ghana and Malawi are two other PRSPs that highlight the different sources of energy and solid fuel use.

The PRSPs for Azerbaijan and for Serbia and Montenegro are the only ones that identify major sources of outdoor air pollution. In

Serbia and Montenegro these include both stationary sources (thermal power plants, the Pljevlja Coal Mine, and large industrial facilities—Aluminium Plant Podgorica; Iron and Steel Works) and mobile sources such as motor vehicles. Given the limited discussion in the PRSP, air pollution and energy use received a score of 2.0.

Access to electricity receives extensive coverage in PRSPs. The Chad PRSP notes that because of exorbitant cost, poor management and distribution, and the absence of a proactive sector policy, electricity is not available for most of the population. (Only 1 percent of the total population and 9 percent of the households in N’Djaména, the capital, have access.) The PRSP draws an implicit link to the use of solid fuels by stating that alternative sources of energy are available which could ease the reliance on firewood and increase access to energy for domestic and productive purposes. These alternative sources of energy, however, are mentioned without discussion of the underlying environmental factors (air pollution) linked to increased health risks. Similar examples are found in the Ghana and Malawi PRSPs.

Box 3 summarizes the discussion of Issues Identification.

### **BOX 3**

#### **Issues Identification: Summary**

##### **Water**

- Discussion of water-related issues is varied in the sample.
- Water supply receives the most attention.
- Urban access to water is greater than rural access.
- Data are unreliable.

##### **Sanitation**

- Sanitation remains secondary to the discussion of water supply.
- All PRSPs that identify sanitation in the sample highlight its importance as critical to environmental health.

##### **Air pollution and energy use**

- Discussion of solid fuels and pollution levels is weak and fragmented.
- Coverage of rural and urban electrification is extensive but is not linked to environmental health.

Indoor air and water pollution stemming from poor sanitation are typically the most important causes of environmental health impacts in most developing countries. These issues are, however, poorly highlighted in the PRSPs reviewed.

If environmental quality is linked to health risks, there will be scope for enhancing already existing measures that can maximize health outcomes.

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## **CAUSAL LINKS ASSESSMENT: ENVIRONMENTAL HEALTH LINKS**

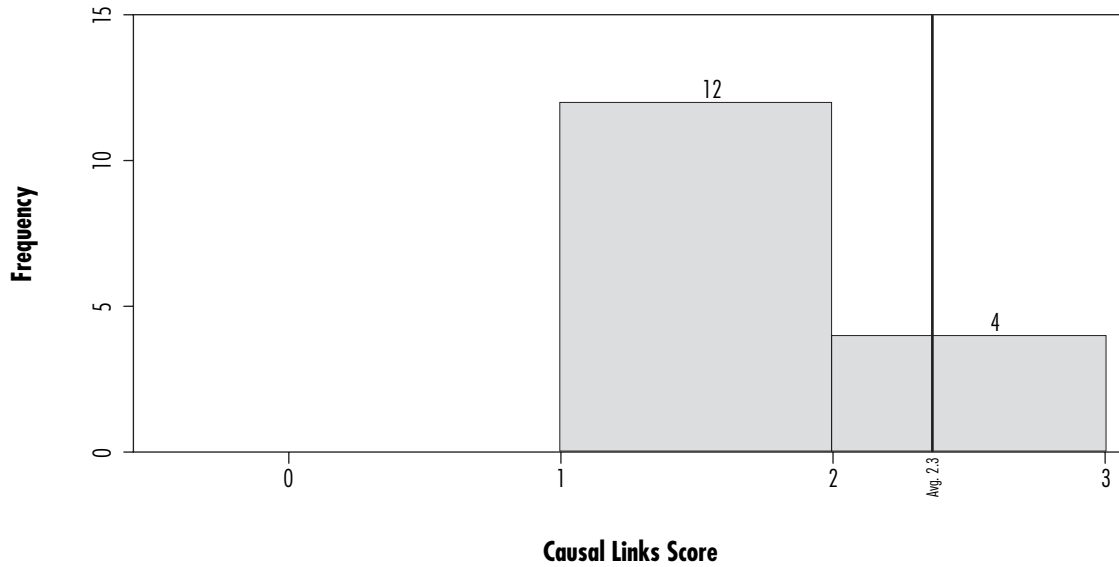
The Causal Links Assessment theme focuses on how and to what extent an association is specified between certain environmental parameters and health. The link captured under this theme is between environmental factors and health outcomes such as waterborne diseases (for example, diarrhea) and respiratory illnesses. The score for environmental health is carried over from previous reviews and is presented as the average score for this theme in the current review.

Causal Links Assessment remains the strongest of the four themes, with an average score of 2.3. This score, however, must be viewed with caution on account of the selection bias, given that the subset for the review consists

of 16 PRSPs which scored 2.0 or higher on environmental health links in Bojö and others (2004). The current review finds that the PRSPs which scored 2.0 contain a passing mention or peripheral discussion of waterborne disease or respiratory disease, or both. Bojö and others (2004) had also concluded that environmental health links in PRSPs are weak and that the weakest among them is the discussion of indoor air pollution.

After an in-depth look at the scores, the current review finds that environmental health considerations under Causal Links Assessment in Bojö and others (2004) ranked 3.0, or good practice, if at least one environmental health link was discussed in detail in the PRSPs. As highlighted in figure 3, despite the bias in the current sample, only four PRSPs have a score of 3.0 (good practice) on the Causal Links Assessment theme.

**Figure 3 Causal Links Assessment: Distribution of scores**



Although good practice examples are few, all PRSPs in the sample do draw a link between waterborne disease and lack of safe water and sanitation. All four good practice examples provide a detailed discussion of waterborne diseases linked to water and sanitation but remain limited in their discussion of health outcomes associated with air pollution (see table 5). The Interim PRSP for Burundi is an example of good practice because it makes an explicit link, identifying inadequate sanitation and the consequent fecal contamination of water as leading to a high incidence of diarrheal disease. The Ghana PRSP has a similar finding. It observes that the north of the country has a 31 percent incidence of diarrhea, which is high compared with the national average of 18 percent, and it further states that the vulnerability and risk of 81 percent of the rural population and a large part of the urban population in periurban areas with respect to waterborne disease may be significant, given their dependence on untreated water. The immediate contributory factors to this problem are identified

as lack of access to safe water and to proper sanitation. The PRSP emphasizes that adequate management of solid and liquid waste is particularly essential for bringing down morbidity and mortality among the poor.

The use of traditional forms of energy such as wood, dung, and other biomass leads to indoor air pollution. Particulate matter from burning of traditional energy sources such as fuelwood increases the risk of respiratory illness in women and young children and diminishes the quality of life of poor households.

**Table 5 Causal Links Assessment: Good practice examples**

Causal links assessment	Good practice PRSPs
<b>Waterborne disease</b>	
Water quality	Burundi, Djibouti, Ghana, Republic of Yemen
Sanitation	Burundi, Djibouti, Ghana, Republic of Yemen

Patterns of energy use have adverse effects on nutrition, health, and productivity.

The review finds that even in our biased sample, very few PRSPs make an explicit link between air pollution and health. There are no good practice examples (table 6). In the sample only one PRSP, that for Mongolia, provides some detail on indoor air pollution. The Mongolia PRSP draws a direct correlation between *ger* heating and the incidence of respiratory disease among children, stating that poor people resort to improper means of heating the *ger* and that this affects the health of older people and children. Since the Mongolia PRSP does not give a detailed discussion on the link between improper heating and health, it receives a score of 2.0 on Causal Links Assessment. The PRSP does highlight that “respiratory diseases have become a major cause of child mortality.”

The review reveals passing mentions of outdoor air pollution from mobile sources and from industrial and thermal plants and their impacts on health. The Serbia and Montenegro PRSP is one example, although it receives a score of 2.0 because of its limited discussion of the subject. According to the PRSP, international epidemiological studies have found an association between high ambient concentrations of pollutants, especially particulate matter, and various negative health impacts in the country. The concentrations of particulate matter, soot,

and sulfur dioxide from some Serbian industrial settlements are high and have a negative impact on health. The PRSP particularly emphasizes the vulnerability of poor people to environmental health impacts such as air pollution. It states that “vulnerable and poor people are the least capable of protecting themselves from exposure by their inability to move to cleaner and safer areas. Therefore, they suffer the highest consequences of such exposure.”

Box 4 presents a summary of the main findings on Causal Links Assessment.

## RESPONSE SYSTEMS

Lvovsky (2001, 39) notes, “The burden of disease due to environmental factors is extremely important in public health, since certain environmental factors are amenable to specific remedial measures—most of which lie outside the health care system.” In Sub-Saharan Africa the potential reduction in dis-

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### BOX 4

#### Causal Links Assessment: Summary

- Good practice examples discuss at least one environmental health link in detail.
- All good practice examples focus on waterborne disease and link it with water, sanitation, and hygiene.
- PRSPs that ranked 2.0 contain a peripheral discussion of causal links.
- Most PRSPs focus on waterborne disease; only a very few PRSPs link indoor or outdoor air pollution with respiratory disease.

Further study is warranted to ascertain whether the most important environmental health issues in the country are included in the PRSP by analyzing the findings in this study against key environmental health indicators.

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**Table 6 Causal Links Assessment: Respiratory disease**

Causal links assessment	Peripheral discussion
<b>Respiratory disease</b>	No good practice examples exist.
Indoor air pollution	Mongolia
Mobile and industrial sources	Serbia and Montenegro

ability-adjusted life years (DALYs) attainable through improved housing and air pollution abatement is between 5.4 and 7.9 percent; the reduction from improvement of water supply and sanitation is between 8.9 and 10.0 percent, and the potential contribution of vector control, sanitation, and drainage leads to a reduction of 7.7–9.9 percent in DALYs.<sup>7</sup> In view of these figures, it is important to focus on responses that can improve environmental health (Lvovsky 2001).

This review assesses the appropriateness of regulatory and institutional frameworks for dealing with environmental health concerns by examining the environmental management capacity in PRSPs to address specific environmental health issues. The PRSPs are further reviewed to identify projects and investments in human-made capital that can help mitigate environmental health problems. Monitoring of these projects and evaluation of their impacts are also included under Response Systems to enable a better understanding of what works in supporting and developing cross-cutting policies that affect environmental health.

Environmental health concerns can be addressed through direct interventions, as well as through indirect poverty reduction strategies that have a bearing on environmental protection and behavioral change. Both direct and indirect responses that have an impact on environmental health are reviewed here.

For the purpose of this study, direct interventions are defined as those responses that address and focus on specific environmental health issues identified in the PRSP, while indirect interventions include the entire large gamut of responses that are geared first of all toward improving environmental conditions

or increasing access to infrastructure services but that could also potentially reduce environmental health risks. To illustrate, supplying stoves in rural areas is a striking example of how an intervention can have an impact on indoor air pollution. When stove provision is suggested in PRSPs as a means of reducing health risks associated with indoor air pollution and thus affecting the incidence of respiratory diseases, it is categorized in this study as a direct response. If the same intervention is placed under the broader umbrella of energy efficiency, it is identified as an indirect response.

Response systems within the PRSPs received an average score of 2.2, suggesting that affirmative measures are being taken to mitigate environmental health impacts. Since the response systems encompass both direct and indirect measures, a broad range of energy- and water-related policy interventions and programs that have spillover effects on environmental health is accounted for in the analysis. Although the variation in the average score is large, ranging from 1.3 to 2.7, high-scoring PRSPs make up the largest group (10 in number), as seen in figure 4.

Here it important to underscore that all water supply and sanitation programs, in addition to meeting fundamental and basic human needs, aim at achieving a positive health outcome. In our sample, most programs and policies tie these responses to reducing waterborne diseases and so are *direct responses*. For water supply specifically, the responses that were looked for in the review focused on the following:

1. Constructing water infrastructure (piped water, boreholes, wells, tubewells, rainwater harvesting, water storage, dikes)

2. Rehabilitating water facilities (pipled water, boreholes, wells, tubewells, rainwater harvesting, water storage, dikes)
3. Extending water supply capacity
4. Promoting management (community based or through local municipal authorities) of water facilities
5. Improving water quality, conservation, and management
6. Expanding wastewater management
7. Improving water quality at the household level (boiling, filtering, etc.)

Good practice examples from the set of PRSPs reviewed for environmental management capacity and for time-bound, costed interventions are listed in table 7.

Interestingly, Kaufmann (2005) emphasizes that for water quality, “the impact depended strongly upon whether the intervention is carried out at the source or at the point of use (that is, in the household).” This corresponds to response 7 in the list above. No PRSP in our sample, however, mentions this response.

For sanitation and hygiene, the good practice responses highlighted in table 7 include:

- Introduction of latrines
- Introduction of other rural water sanitation technologies (sanitary drainage services such as closed pit)
- Outreach programs for awareness raising on the importance of sanitation- and hygiene-related programs
- Sewage and waste management.

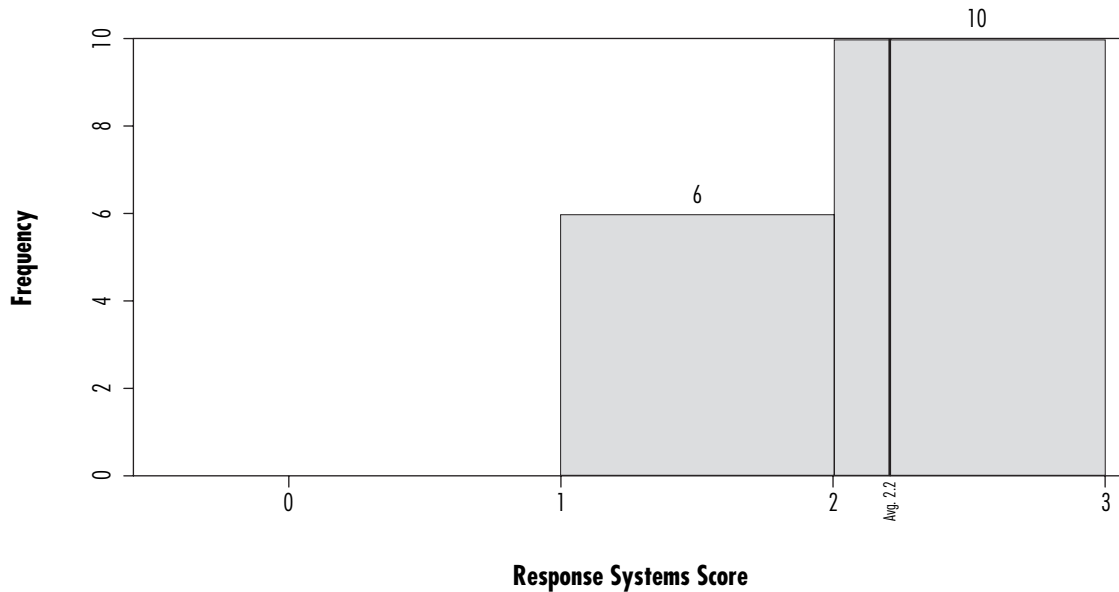
For energy-related interventions and policies, *all* of the responses are linked only indirectly to environmental health outcomes; they are not tied to the incidence of respiratory disease.

As shown in table 7, the responses highlighted in the set of PRSPs reviewed that occur most frequently are:

- Provision of alternative energy options other than solid fuels (e.g., biogas)
- Provision and dissemination of energy-efficient stoves
- Rehabilitation of power plants and the power grid and expanded electrification (including hydropower and renewable options) in rural and urban areas
- Air pollution abatement measures, including emissions reduction technology, air quality management, and emissions monitoring systems for pollution from transport or from stationary sources such as power plants and industries.

Specifically, for indoor air pollution, the two most relevant and effective policy interventions would be the provision of alternative energy options, such as kerosene or liquefied petroleum gas (LPG), and of improved stoves to vent smoke out (via a chimney) and minimize the use of solid fuels, through more efficient burning. In the PRSPs, however, both these responses were linked with improving energy efficiency or encouraging fuel substitution, not environmental health. No information is provided in the PRSPs on improvement of housing conditions or on behavioral modification as responses to indoor air pollution.

*Environmental management capacity.* Responses or actions in PRSPs capturing environmental legislation, regulations, standards, awareness raising, data and information systems, and institutional and enforcement capacity building to alleviate environmental health risks are assessed here.

**Figure 4 Response Systems: Distribution of scores**

The Djibouti, Malawi, Republic of Yemen, and Zambia PRSPs illustrate good practice in identifying energy- and water-related responses under this topic. The broader vision in the energy policy framework in the Zambia PRSP underscores the importance of efficiency and the sustainable utilization of nonrenewable energy resources. These interventions and responses, however, are not directly linked with an impact on indoor air pollution, and so they are classified as *indirect responses*. Our sample of PRSPs includes several cases in which responses are referred to without initially defining the problem and the effect of the responses on the environmental health link (see box 5). Nevertheless, it is important to note that an environmental health outcome is being achieved as a secondary effect.

A specific intervention is Zambia's Efficient Production and Utilization of Wood Fuel Program, which aims both to minimize the use of wood fuel and to decrease dependence on charcoal. This intervention will certainly have an effect on environmental health in

lower-income households. A charcoal production manual issued under a similar project is expected to assist rural communities with

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#### **BOX 5** **Integrated pest management in Cambodia**

The link between use of harmful pesticides and agrochemicals and human health is not explicitly made in any PRSP and so is not part of this review. The Cambodia PRSP, however, does provide an example that should be noted.

The PRSP states that extremely toxic and banned pesticides, including DDT, are still being used in agriculture in Cambodia. It emphasizes the need for enforcement of a subdecree on agricultural material standards, for public education programs, and for integrated pest management to ensure that farmers and consumers are aware of pesticide and agrochemical hazards. Interestingly, it highlights these responses without identifying problems that affect agricultural production and land as a result of use of these pesticides (Issues Identification) or the possible ramifications for human health from exposure to these chemicals (Causal Links Assessment).

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increasing their production efficiency in earth kilns. Efforts to improve end-use efficiency through the adoption of improved stoves are also being encouraged by the government.

For the urban population, the Zambian government is considering the substitution of millenium gel fuel (ethanol produced from molasses) for charcoal for lower-income households. Other alternative fuels that can replace charcoal in groups of households are also being looked at. To help determine the way forward for fuels such as liquefied petroleum gas (LPG), feasibility studies are expected to be undertaken by the government.

Responses identified in PRSPs are intentions and need to be followed through by concrete actions. This review examines the case study of Ghana to ascertain the extent of follow-up on the stated intentions (see box 6).

Most PRSPs include a detailed discussion of national electrification plans that cover both rural and urban access. Increasing access to rural and urban electrification can have a substitution effect on energy use that can lower indoor pollution levels for some income groups. Such plans identify options for electrification at least cost, review the administration and economic feasibility of electricity generation and distribution, and assess alternative renewable energy sources. Several PRSPs identify these plans but without mentioning their impacts on environmental health. Discussions of national electrification plans serve as a minimum basis for scoring environmental management capacity in PRSPs, as do those responses in water supply that relate specifically to access.

Most PRSPs contain little or no information on air pollution abatement. Three of the papers do

highlight such responses, but (like the response in the Azerbaijan PRSP on developing monitoring systems for emissions from transport and other stationary sources) they are not explicitly linked to associated health outcomes.

*Investments in human capital.* Specific investments that can influence environmental health or that have the potential for making a significant impact on environmental health can be found in projects in water supply and sanitation, urban development, pollution control, transport, energy and rural development, and health.

Most strategies for safe water identified in PRSPs revolve around expanding access to water in both urban and rural areas and raising people's accountability for its management. Although all documents contain detailed discussions of water and sanitation strategies, identification of specific investments in human-made capital for increasing access or improving quality is limited. For water supply, the interventions highlighted in PRSPs can include detailed plans for investments in water infrastructure such as increasing water supply by means of piped networks and by rehabilitating or constructing boreholes, tubewells, water storage facilities, and waste management plants. As for sanitation, most PRSPs, including the good practice examples, do not clearly identify specific interventions for sanitation that are outlined in the strategies.

In addition, the review finds that very few PRSPs outline time-bound interventions based on the strategies they identify, nor is there a preliminary assessment of the resource envelope for most of these projects. Those PRSPs that do identify time-bound, costed actions are identified as good practice.

**BOX 6****Ghana: From intention to action (PRSP to PRSC)**

The aim of PRSPs is to outline poverty alleviation strategies; poverty reduction support credits (PRSCs) support actions to implement these strategies. Environmental health strategies identified in PRSPs thus require follow-up in PRSCs. PRSCs evolve from PRSPs and provide tailored support to development and country-owned reform programs. They are intended to focus on poverty reduction as a central objective of development assistance. Through PRSCs, the World Bank supports key reforms along with the expansion of health, education, energy, and water and sanitation services for the poor. A previous review has found a disconnect in the implementation of PRSPs and PRSCs (Bojö and others 2004). Hence, this example takes a PRSP and attempts to follow its progress through to implementation, by analyzing the corresponding PRSC. However, it needs to be treated with caution, as the PRSC is only one of several donor instruments supporting implementation of the PRSP. Furthermore, the primary non-donor instruments supporting PRSP implementation include the country's own planning and budgetary processes.

The Ghana PRSP notes that poverty is directly linked to lack of access to safe water and adequate sanitation. Diseases affecting the poor in Ghana include diarrhea, malaria, and guinea worm. Given the incidence of waterborne diseases, the vulnerability of the 81 percent of the rural population that depends on untreated water is a matter of concern. The problem may be no less severe in urban districts and, especially, in periurban areas.

The PRSP stresses that increasing access to potable water and sanitation is key to achieving improved health outcomes and sustained poverty reduction. Strategies for providing safe water focus on expanding access in rural, periurban, and unserved poor urban areas. The emphasis is on

- Acceleration of rural water provision, with emphasis on guinea worm–endemic communities and regions that have benefited least from new investments in the past decade
- Effective management of urban systems
- Safe management of liquid and solid waste
- Capacity building for environmental health.

Some responses are identified with regard to the use of biomass as fuel in rural areas. These include

- Assisting communities to develop woodlots
- Introducing renewable energy technologies such as solar photovoltaic systems and biogas
- Introducing and promoting energy-efficient technologies for domestic users.

The renewable energy sources to be promoted include solar, wind, and biogas, according to the strategies identified. The following steps will be taken to improve the supply of energy for production:

- Introduce and support the development of renewable energy technologies.
- Ensure that electricity supply to rural areas is capable of being used for productive purposes.
- Promote the productive use of electricity in rural areas and by the poor.

The PRSC supports the expansion of energy services while protecting the poor. The emphasis, however, is on power sector reform, including the implementation of the public-private partnership plan. The discussion of expansion of rural electrification and increased access for the rural poor remains ambiguous.

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**BOX 6** (continued)

**Ghana: From intention to action (PRSP to PRSC)**

With regard to water supply and sanitation, the PRSC policy objective is to increase access for rural and small-town populations. For PRSC III (the third Credit in support of the PRSP) the following main objectives are identified:

- Begin implementation of a cabinet-approved comprehensive sector policy.
- Carry out hydrogeological database mapping for better targeting of investments.
- Support deprived districts in preparing water and sanitation plans to guide investors.

The outcome of these efforts is expected to increase access to safe water to 55 percent and access to proper sanitation to 28 percent by 2006. The PRSC emphasizes the importance of increasing sector investments in water supply and sanitation, along with improved sectoral planning and coordination in the water sector.

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The Chad PRSP lays out a detailed and comprehensive list of investment opportunities for improving water supply and sanitation efforts, as well as water treatment. An example is the project to construct and equip water collection and storage facilities in the country's water-scarce Sahelian zone. The main purpose of this 3.2 billion CFA franc project is to increase the availability of water in rural areas over five years and to ensure the sustainable operation of water supply works.<sup>8</sup> Another example is the implementation of the village-level water supply and water resource management component of the master plan for water and sanitation. This 20-year project aims at

- Improving the water supply at the village level by strengthening institutional, legislative, and regulatory frameworks at the local and national levels
- Improving knowledge about and management of surface water
- Assisting in the monitoring of groundwater resources
- Studying the implementation of warning systems for accidental oil pollution that has impacts on environmental health.

A specific response to vector-borne diseases such as malaria is also highlighted in the Chad PRSP. The PRSP states that "the use of treated mosquito netting will be encouraged and provided to vulnerable households, along with increasing the number of prevention and treatment programs." This discussion is followed through by specifying the number of mosquito nets to be distributed.

*Monitoring of outcomes.* Monitoring the impacts of human resource outcomes is critical for understanding the extent to which policies and programs are successful. This review focuses on physical and health indicators. Health indicators include infant mortality, under-five child mortality, and morbidity; physical indicators include the percentage of the population with access to safe water and sanitation; energy demand and electricity coverage in rural and urban areas; air quality measures; and the burden of disease from air and water pollution. Monitoring poverty reduction strategies from an environmental health perspective requires a combination of quantitative and qualitative methods across many sectors. For example, the indicator "population with access to water

**Table 7 Response Systems: Good practice examples**

Responses and their links	Environmental management capacity	Time-bound costed investments
<p><b>Water supply programs are tied to waterborne diseases. (All are direct responses.)</b></p> <p>Construct water infrastructure (piped water, boreholes, wells, tubewells, rainwater harvesting, water storage, dikes)</p> <p>Rehabilitate water facilities (piped water, boreholes, wells, tubewells, rainwater harvesting, water storage, dikes)</p> <p>Extend water supply capacity</p> <p>Promote management (community based or through local municipal authorities) of water facilities</p> <p>Improve water conservation and management</p> <p>Expand wastewater management</p> <p>Improve water quality at the household level (boiling, filtering, etc.)</p> <p><b>Sanitation programs are tied to waterborne diseases. (All are direct responses.)</b></p> <p>Introduction of latrines</p> <p>Introduction of other rural water sanitation technologies (sanitary drainage services such as closed pit)</p> <p>Outreach programs for awareness raising</p> <p>Sewage and waste management</p> <p><b>Responses to vector-borne diseases, especially malaria, are identified. (All are direct responses.)</b></p> <p>Outreach, preventive interventions, and programs (focus on drainage of water, covering vessels with water)</p>	<p>Djibouti, Ghana, Malawi, Republic of Yemen, Zambia</p> <p>Djibouti, Ghana, Malawi, Republic of Yemen, Zambia</p> <p>Djibouti, Ghana, Malawi, Republic of Yemen, Zambia</p> <p>Djibouti, Ghana, Malawi, Zambia</p> <p>Djibouti, Malawi, Republic of Yemen, Zambia</p> <p>Djibouti, Ghana, Republic of Yemen, Zambia</p> <p>Ghana, Malawi</p> <p>Djibouti, Ghana, Malawi, Republic of Yemen</p> <p>Ghana, Malawi</p> <p>Djibouti, Ghana, Republic of Yemen, Zambia</p> <p>Azerbaijan, Djibouti, Ghana, Malawi, Republic of Yemen, Zambia</p>	<p>Azerbaijan, Chad, Djibouti, Ghana, Malawi, Senegal, Republic of Yemen, Zambia</p> <p>Azerbaijan, Chad, Djibouti, Ghana, Malawi, Republic of Yemen, Zambia</p> <p>Azerbaijan, Chad, Djibouti, Ghana, Malawi, Republic of Yemen, Zambia</p> <p>Azerbaijan, Djibouti, Ghana</p> <p>Djibouti, Ghana, Zambia</p> <p>Azerbaijan, Chad, Djibouti, Ghana, Republic of Yemen, Zambia</p> <p>Ghana</p> <p>Ghana</p> <p>Ghana</p> <p>Djibouti, Ghana, Republic of Yemen, Zambia</p> <p>Azerbaijan, Chad, Djibouti, Ghana</p>

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**Table 7 Response Systems: Good practice examples** (continued)

Responses and their links	Environmental management capacity	Time-bound costed investments
Distribution of mosquito nets	Djibouti, Ghana, Malawi	Chad, Ghana
<b>Energy programs are tied to health outcomes. (All are indirect responses.)</b>		
Provision of alternative energy options (e.g., biogas) as substitutes for solid fuels	Djibouti, Ghana, Zambia Ghana, Malawi, Zambia	Azerbaijan, Chad, Djibouti,
Provision or dissemination of energy-efficient stoves	Malawi	Chad, Malawi, Zambia
Rehabilitation of power plants and power grid and expanded electrification, including hydropower and renewable options	Azerbaijan, Djibouti, Ghana, Malawi, Serbia and Montenegro, Republic of Yemen, Zambia	Azerbaijan, Chad, Djibouti, Ghana, Malawi, Republic of Yemen, Zambia
Air pollution abatement	Azerbaijan	Azerbaijan

supply and sanitation” does not necessarily provide an insight into water quality or health outcomes. Clearly defined indicators that are monitored over time can, however, gauge the success of specific investments with respect to environmental health. Strong national public health surveillance systems, environmental monitoring systems, and service provision monitoring systems are all crucial in this regard.

All of the PRSPs reviewed here identify indicators for water supply and sanitation. These include access to potable water in rural and urban areas and infant and child mortality rates. When the most common indicators provided in most PRSPs are combined with “measurable” actions and indicators, the PRSPs are ranked as good practice.

According to the PRSP for Serbia and Montenegro, health status data indicate that water-related diseases are not a significant contributor to the burden of chronic or acute disease there

but that the situation may change as a result of deteriorating water quality. The PRSP specifically states that

mortality among infants and children under five, a common indicator of water supply and sanitation conditions, has declined by one half during the 1990s and is associated with improved household sanitation and improved treatment for diarrhea and acute respiratory disease. The under-five mortality rate for diarrhea declined by 38.2% during the 1990–97 period. However, there are some indications that the situation is changing. Deterioration in the quality of drinking water may well reverse the positive trend in the under-five mortality rate.

Despite this information, the PRSP does not identify measurable actions that can be monitored over time, and so it receives a score of 2.0.

Similarly, the Azerbaijan PRSP provides an interesting discussion of the rapid increase in malaria between 1990 and 1996, after which the trend was reversed. In 1999, according to the PRSP, the reported incidence of malaria was less than half that in 1998, and it continued to fall to about 19 per 100,000, or about 1,600 cases, in 2000. The review finds that such indicators can gauge the success of specific interventions undertaken by the government to combat malaria. Since the Azerbaijan PRSP mentions this in an isolated instance and does not provide similar indicators or monitorable targets, it also receives a score of 2.0.

The Cambodia PRSP is a good practice example, as it ties specific objectives to measurable actions, in addition to the commonly identified

indicators found in most PRSPs. For example, for the strategic objective of “supplying safe drinking water,” a list of measurable actions—“providing 2000 water points, 155 piped water systems in 24 provinces by 2005 and improving water quality mapping”—is further supplemented by targets for improving the delivery of oral rehydration solution to treat diarrhea in children. The Cambodia PRSP also identifies targets for lowering the incidence of malaria and respiratory disease. It receives a score of 3.0.

Indicators on air pollution monitoring and the incidence of respiratory disease attributable to indoor air pollution are limited in PRSPs.

Box 7 summarizes the discussion of environmental health and Response Systems.

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## **BOX 7**

### **Response Systems: Summary**

- Several responses are identified without initially defining the problem and the effect of the responses on environmental health outcomes.
- Direct and indirect responses that affect environmental health are identified in this review.
- Environmental health outcomes may be achieved as secondary products of responses that are being carried out primarily to fulfill other, nonhealth, objectives.

#### Water supply and sanitation

- All water supply and sanitation programs are classified as direct responses in this sample.
- For water quality, no intervention is identified at the household level in the set of PRSPs reviewed.
- For water supply, the interventions highlighted in PRSPs sometimes include detailed plans for investments in water infrastructure.
- For sanitation, investments in most PRSPs, including the good practice examples, do not clearly specify targeted interventions.
- All PRSPs identify indicators for water supply and sanitation.

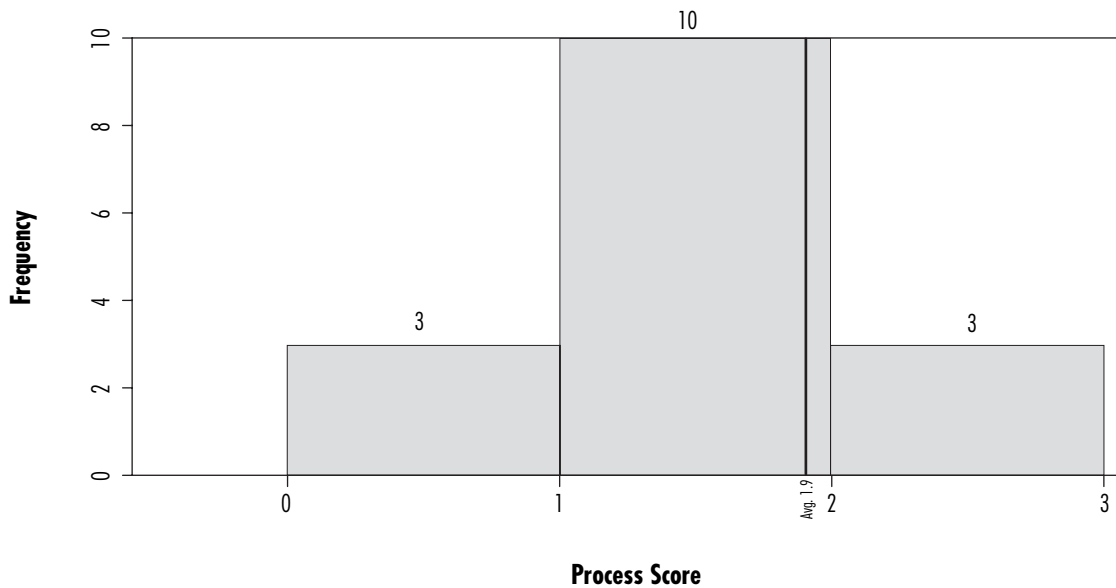
#### Air pollution and energy

- Energy-related interventions and policies are indirect responses in the sample.
- Electrification is covered extensively.
- Responses for indoor air pollution are identified from an energy-efficiency perspective.
- Indicators on air pollution monitoring and on the incidence of respiratory disease caused by indoor or outdoor air pollution are rare in PRSPs.

The review finds that strategies could be better designed to maximize environmental health outcomes and thus achieve more than one objective.

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**Figure 5 Process: Distribution of scores**



**PROCESS**

Environmental health requires a multisectoral approach at all levels, national and local, to mitigate risks and improve health conditions for the poor, who are particularly vulnerable to these risks, through the application of integrated efforts across different sectors. Under this theme, two specific aspects were reviewed within PRSPs: the extent to which vulnerable groups affected by environmental health concerns are identified, and the level of intersectoral coordination between governments, ministries, and other stakeholders, which is needed to enable the effective implementation of strategies and programs.

Since this review is a desk study, there is no way to gauge the actual integration of these processes or their level of effectiveness in the poverty reduction strategies. The study simply covers how the two issues under Process are treated in PRSP reports.

The average score for Process is 1.9, slightly weaker than for Causal Links Assessment and Response Systems (figure 5). This implies that the identification of vulnerable groups and the extent of intersectoral coordination reflected in PRSPs are not clearly defined across the sample. Good practice examples are highlighted in table 8.

Most PRSPs identify women and children as being susceptible to waterborne diseases. All PRSPs identify rural populations as being especially vulnerable to environmental health impacts as a consequence of lack of access to potable water. In the PRSPs that highlight

**Table 8 Process: Good practice examples**

Process	Good practice PRSPs (score, 3.0)
Water initiatives	Chad; Ghana
Energy-related initiatives	Zambia

indoor air pollution, there is limited mention of vulnerable groups. In some PRSPs, such as that for Serbia and Montenegro, a link is made between indoor air pollution and vulnerable groups, and poorer sections of the population, particularly women and children, are identified as being marginalized.

The Serbia and Montenegro PRSP takes the environmental health analysis a step further by identifying vulnerable populations such as the Roma community. Within Roma settlements, access to utilities such as electricity, water, sewerage, and garbage collection is nonexistent or limited, leading to the prevalence of hepatitis, trachoma, and other communicable diseases. Cambodia's PRSP highlights tribal and forest dwellers as being susceptible to waterborne diseases. A few PRSPs, such as that of the Republic of Yemen, go a step further by discussing the existing intraregional disparities in access to basic services. All these PRSPs receive a score of 2.0 because of their limited discussion of the subject.

When reconciling environment and health, strong intersectoral coordination and cooperation among government ministries are imperative. PRSPs are weak in identifying linkages between the different ministries handling programs and projects that have an impact on environmental health. The review finds that most PRSPs highlight the relevant ministries for water supply.

Sanitation is placed under the same umbrella as water, although the extent of the role of ministries in implementing and monitoring specific sanitation and hygiene programs remains ambiguous. Where a clear role of a ministry is identified and is linked with a

specific intervention, the PRSP is singled out as good practice.

The Chad PRSP (score, 3.0) is noteworthy. In Chad an intersectoral coordination effort between the Ministry of Territorial Development, Urban Planning and Housing; the mayor's office; the Sanitation Committee; and the non-governmental organization (NGO) community aims at

- Building or rehabilitating 800 tubewells and 50 large-diameter wells per year
- Making the population accountable for managing water access points
- Providing eight urban centers with integrated systems for safe drinking water and sanitation
- Creating sewer and drainage systems
- Removing household trash, industrial and commercial waste, and human waste.

Implementation is jointly managed and administered by the various stakeholders in close coordination with each other.

The Ghana PRSP offers another good practice example. In addition to multisectoral coordination, the PRSP flags the implementation of programs based on subregional priorities—for example, water supply and sanitation programs in guinea worm—endemic areas and expanded electrification in regions where electrification is less than the national average of 27.1 percent.

The Zambia PRSP also receives a score of 3.0 for describing the collaboration of the Department of Energy with other institutions in various energy subsectors to improve efforts to promote alternative fuels that can replace charcoal in poor households.

Box 8 presents a summary on Process.

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**BOX 8**

**Process: Summary**

**Vulnerable groups**

Vulnerable groups are defined as those most likely to be affected.

- Women and children are most vulnerable to environmental health concerns across the sample.
- Few PRSPs identify specific vulnerable groups.
- Intraregional disparity is explicitly highlighted in some cases.

**Intersectoral coordination**

- Relevant ministries for the implementation of water programs and energy programs are identified.
- Sanitation remains unduly orphaned, although implementing agencies are assumed to be the same as those implementing water supply programs.

Programs and projects may be rendered more effective by a clear delineation of focal agencies and their corresponding responsibilities.

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## Conclusions

**D**espite the small sample size, a number of conclusions can be drawn from this review.

*Environmental health is not systematically addressed in PRSPs.* The discussion of environmental health in the sample is weak and tells only a partial story. There is a disconnect, given the fragmented discussion of environmental health across the four themes: Issues Identification, Causal Links Assessment, Response Systems, and Process. The lack of a comprehensive thread that connects the description of what the environmental problem is, what impact it has on human health, what the gamut of responses is, and how implementing agencies follow through with clearly defined projects and address the concerns of the most vulnerable groups is a weak point in the discussion of environmental health problems in PRSPs.

*Water and sanitation receive more attention than do air- and energy-related environmental health concerns.* Issues related to water and sanitation occupy the most significant place under environmental health across all themes; issues related to air pollution linked primarily to respiratory illness come in a distant second.

Water and sanitation programs and projects are directly focused on achieving better environmental health outcomes as a result of enhanced water quality, increased access to water, and improved sanitation, while air pollution abatement and energy-related responses often focus on energy efficiency rather than on environmental health. Is it safe to conclude that many of the countries in our sample are unlikely to be affected by critical indoor air pollution problems leading to respiratory disease, in view of the lack of attention that exists in PRSPs? Or could it be that water receives more attention precisely because of the significant amount of background work that has been undertaken to understand water-related environmental health links? If the latter is true, there is great scope for strengthening analytical work on air- and energy-related environmental health issues to raise awareness of the problems.

*Sanitation remains secondary to water supply.* Although PRSPs recognize sanitation as critical to the incidence of diseases such as diarrhea, sanitation is usually addressed as an adjunct to water supply. Access to basic water supply is indeed important in tackling environmental health problems, but improved sanitation

and hygiene have an equally vital role, which needs to be highlighted more strongly.

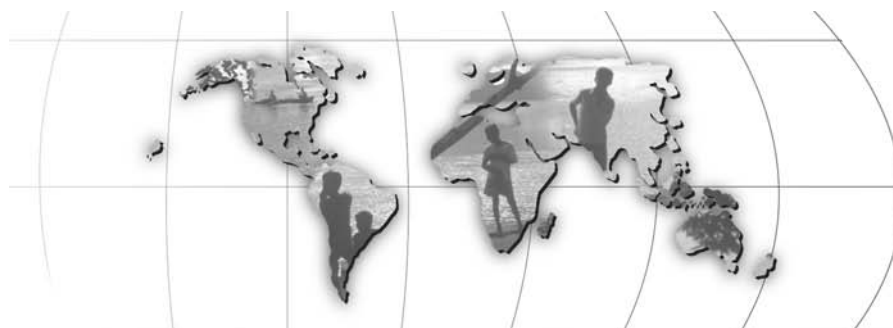
*There is scope for enhancing already existing measures to maximize health outcomes.* In several instances, responses that could reduce environmental health risks are identified without a clear delineation of critical issues or of the links between the associated environmental factors and human health. Such responses are classified here as indirect responses. If environmental health benefits are not taken into account in a strategy, indirect responses become truly missed opportunities. Countries must capture these missed opportunities by effectively ensuring that where possible, responses achieve multiple benefits. Countries can draw on various resources to help strengthen their understanding of environmental health issues, streamline responses, and focus on achieving environmental health outcomes. Finally there is a need to address the irregularity in data and unreliability of information on environmental health issues that is reflected in PRSPs, through stronger public health surveillance systems.

*Forward movement on environmental health requires clarification of ownership.* PRSPs often are not clear in assigning responsibilities within the public sector for actions to improve

environmental health outcomes. What makes an environmental health program difficult to implement is its cross-cutting, multisectoral nature. Intentions highlighted in PRSPs have to be followed through with actions. In order to facilitate this, clear assignment of responsibilities is essential.

This is particularly important since environmental health outcomes cannot be achieved solely by encouraging measures in the health sector or by finding solutions to environmental degradation issues, even if these responses are accounted for, as in this study on environmental health. A holistic, strategic approach is required whereby environmental protection, infrastructure development, institutional strengthening and accountability, health services, and education and outreach programs are combined so as to systematically improve environmental health outcomes over time.

The review has found several examples of good practices, illustrating that there are models to build on and learn from. Poor health associated with environmental factors is another dimension of poverty, and one that it is crucial to recognize in PRSPs. This review indicates the clear scope for improvement in addressing environmental health issues in poverty reduction strategies.



## Appendix

# Documents Reviewed at the Interim, PRSP, Progress Report, and PRSC Stages

Country	Region	Interim poverty reduction strategy paper (PRSP)	PRSP	Implementation progress report	Poverty reduction support credit (PRSC)	
Azerbaijan	ECA	November 2003	May 14, 2003	May 2004		
Burundi	AFR					
Cambodia	EAP		February 2003			
Chad	AFR		June 2003		August 2004	
Djibouti	MNA		March 2004			
Ethiopia	AFR		September 17, 2002		December 2003	PRSC I
Ghana	AFR		March 4, 2003		May 2004	PRSC I
Guinea	AFR		July 25, 2002			
Kyrgyz Republic	ECA		January 23, 2003		April 2004	
Malawi	AFR		August 29, 2002		October 2003	
Mongolia	EAP		July 2003			
Rwanda	AFR		August 6, 2002			PRSC I
Senegal	AFR		November 20, 2002			
Serbia and Montenegro	ECA		February 18, 2004			
Yemen, Republic of	MNA		August 2002			
Zambia	AFR		May 22, 2002			

Note: AFR, Sub-Saharan Africa; EAP, East Asia and Pacific; ECA, Eastern Europe and Central Asia; MNA, Middle East and North Africa.





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## Notes

- <sup>1</sup> For example, a recent World Bank cost of degradation study in Lebanon and Tunisia relies on health impact studies to quantify and monetize the cost of degradation on a macro level across a wide range of environmental issues (Sarraf, Larsen, and Owaygen 2004). The study finds that the cost of environmental degradation in Lebanon is in the range of 2.8 to 4.0 percent of gross domestic product (GDP). The main cost factors identified include (a) the significant disease burden and averted expenditure associated with the lack of safe water and sanitation and inadequate hygiene, and (b) substantial negative health impacts from air pollution.
- <sup>2</sup> IDA, the International Development Association, is the arm of the World Bank that extends grants to poor countries on concessional terms.
- <sup>3</sup> A related issue is the large discrepancies in reliability of information and in monitorable data on environmental health conditions and environmental degradation. Strengthening of public health surveillance systems and environmental monitoring systems is crucial for improving the quality of these data.
- <sup>4</sup> The environmental health risks from exposure to agroindustrial wastes are not highlighted in most PRSPs, as was evident from an initial screening.
- <sup>5</sup> Although investments in human-made capital can include health infrastructure, this study on environmental health focuses on preventive, not curative, measures.
- <sup>6</sup> Ideally, use of liquefied petroleum gas (LPG) and kerosene, which represent the next step up the energy ladder from biomass fuels, would be a better indicator of movement toward cleaner fuels. Information in PRSPs on these cleaner fuels is, however, poor (with some exceptions mentioned in this report), and so we have used electrification as a more “gross” indicator of that shift. It is important to keep in mind that often, lowest-income groups may not be able to afford electricity.
- <sup>7</sup> The DALY concept measures the equivalent years of “healthy” life lost to poor health, disability, or death. Using DALYs as a measure of the burden of disease provides a consistent basis for comparing the cost-effectiveness of alternative interventions designed to improve health (Murray and Lopez 1996).
- <sup>8</sup> CFA refers to the Coopération financière en Afrique Centrale

