

Do rich nations “owe” poor ones for eco-damage?

Courtesy University of California - Berkeley and World Science staff

Environmental damage caused by rich nations disproportionately harms poor ones— and costs them more than their total foreign debt of \$1.8 trillion, researchers say.

So concludes a study billed as the first global accounting in dollar terms of nations' toll on the environment. A graphic summarizes findings of a new study on the environmental impacts of rich, middle-income and poor nations on each other. (Graphic courtesy Thara Srinivasan/UC Berkeley)

At least to some extent, “rich nations have developed at the expense of the poor... in effect, there is a debt to the poor,” said Richard B. Norgaard, an ecological economist at the University of California-Berkeley, one of the researchers. “That, perhaps, is one reason that they are poor.”

There will be much “controversy,” he admitted, “about whether you can even do this kind of study and whether we did it right.” Norgaard said he'd like to offer a challenge to any researchers who may doubt its findings: “do [the study] your self and do it better.” This first one, he added, is mainly meant to get people thinking.

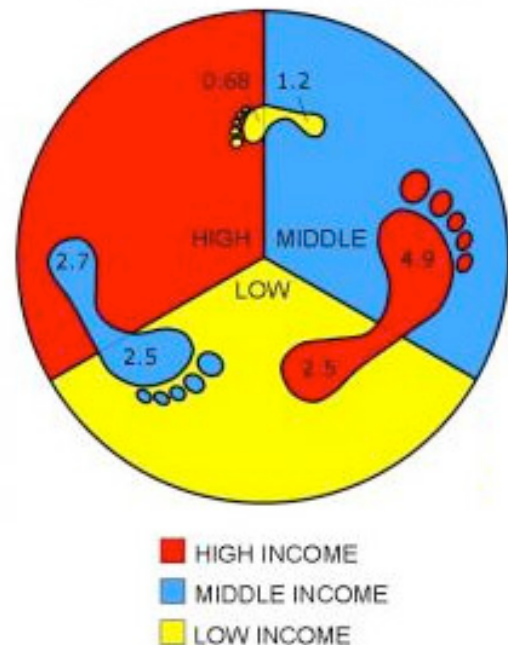
The calculations drew on more than a decade of assessments by environmental economists who have tried to attach monetary figures to environmental damage, plus data from the recent U.N. Millennium Ecosystem Assessment and World Bank reports. To simplify the monumental task, researchers focused on just six types of environmental damage: farming intensification and expansion, deforestation, over fishing, loss of mangrove swamps and forests, ozone depletion and climate change. Other types of damage seen as harder to appraise were ignored, such as industrial pollution and loss of habitat and biodiversity.

Thus, the result is a low-end estimate of costs, the investigators said. Given that, “the numbers are very striking,” said lead researcher Thara Srinivasan, of the Pacific Ecoinformatics and Computational Ecology Lab Berkeley, Calif., an institute that calls itself by the acronym PEaCE. The investigators reported the findings this week in the early online edition of the research journal *Proceedings of the National Academy of Sciences*. “Humanity has transformed our natural environment at an unprecedented speed and scale,” Srinivasan said, noting that the Earth's population doubled in the past 50 years to 6.5 billion as the average per-capita gross world product also doubled. “What we don't know is which nations around the world are really driving the ecological damages and which are paying the price.”

Norgaard said the largest environmental impact by far is from climate change, which has

Where Ecological "Footprints" Fall

Upper bound footprints of income groups on other groups (trillions 2005 international \$)



been assessed in previous studies. The new study broadens the assessment and thus provides a context for the earlier work, he added.

The study found, for example, that while deforestation and farming intensification primarily impact the host country, the impacts from climate change and ozone depletion are spread widely over all. "Low-income countries will bear significant burdens from climate change and ozone depletion. But these environmental problems have been overwhelmingly driven by emission of green house gases and ozone-depleting chemicals by the rest of the world," Srinivasan said.

Scientists predict climate change will increase the severity of storms and extreme weather, including prolonged droughts and flooding, with an increase in infectious diseases. Ozone depletion mostly impacts health, with increases expected in cancer rates, cataracts and blindness. Overfishing and conversion of mangrove swamps to shrimp farming were other areas in which rich nations were judged to be burdening poor ones.

"Seafood derived from depleted fish stocks in low-income country waters ultimately ends up on the plates of consumers in middle-income and rich countries," Srinivasan said. Mangrove destruction eliminated storm protections, the group added, which some say was a major factor in the huge casualty toll from 2005's South-east Asian tsunami. When all the impacts are added up, the portion of the "foot print" of high-income nations falling on low-income countries is greater than the financial debt recognized for low-income countries, with a net present value of \$1.8 trillion in 2005, Srinivasan said. (This was calculated in international dollars, U.S. dollars adjusted to account for different currencies' purchasing power.) "The ecological debt could more than offset the financial debt of low-income nations," she said.

Interestingly, middle-income nations may have an impact on poor nations equivalent to that of rich nations, the study concluded. While poor nations impact other income tiers also, their effect on rich nations was found to be less than a third of the impact in the opposite direction

Image: Graphic summarizes findings of a new study on the environmental impacts of rich, middle-income and poor nations on each other. (Graphic courtesy Thara Srinivasan/UC Berkeley)