

Sustainable Development Update

– Keeps you updated on the interactions between ecological issues and social and economic development

Issue 1, Volume 2, January 2002

Danish statistician Bjorn Lomborg in his book:

–**The global environment is getting better**

A large group of Environmental scientists:

–**Lomborg's book is flawed and unscientific**

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“More people worldwide are now displaced by natural disasters than by conflict”

From "Unnatural Disasters" a recent report from the Worldwatch Institute.

[Read more on page 3](#)

Ecological Footprints

- Reconnect us mentally to Nature, and show the inequities between rich and poor



[Read the featurearticle on page 2](#)

Editorial:

The journey to sustainability

World leaders will gather later this year in Johannesburg for the UN World Summit on Sustainable Development. In preparation for Johannesburg, international organisations, development agencies and NGO's are reviewing what has been achieved since the 1992 Rio Earth Summit, setting the agenda for this year's summit. The goal of the Summit is to reach a consensus on the definition of sustainable development and its practical implications.

One central theme at the Johannesburg summit will be the interaction between environment, poverty, and development. According to some measures, world economic development has produced gains unparalleled in human history. Unfortunately, the economic growth of most rich and many poor nations has been achieved by depleting the natural environment, as we reported in the previous issue of SDU. The gains have also been unevenly distributed – a large share of the world population remains extremely poor. People in developing countries are generally more directly dependent on the benefits

provided by their local natural ecosystems. Therefore, these are the regions where the impacts of global environmental change – mostly caused by the developed world – will unfold in the most dramatic ways. Poorer countries are also less able to afford mitigation and adaptation measures.

As we prepare for our journey to Johannesburg, we must recall that the environmental issues are not just ethical, or of concern only to environmentalists.

Ecosystems and the biodiversity they support should not be conserved only for their own sake, but because they sustain the potential and capacity for social and economic development. Ecological systems provide essential goods and services. Biodiversity provides the insurance needed for ecosystems to be able to withstand, respond and adapt to global environmental change.

Protecting these natural assets secures our own health, livelihood and food security – in short, our future development potential.

Dr. Fredrik Moberg, Editor



“Golden Rice” and other Genetically Modified Crops

An environmentally friendly way to alleviate hunger?

[Read more on page 4](#)

“Sustainable futures are ones in which the basic means of human livelihood get easier, human opportunities become richer, and nature's diversity is more sustained — and not only in the rich parts of the world”.

C.S. Holling, Professor, University of Florida, USA, 2001

More at:
www.consecol.org/vol4/iss2/art7

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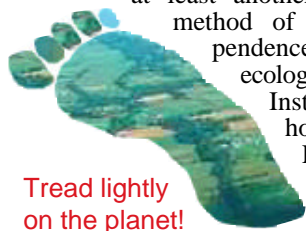
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– show our dependence on Nature, and the inequities between rich and poor

Ecological footprints reconnect us mentally to Nature. They show how large areas of land and water people require to provide them with natural resources and absorb the waste they produce. The average per capita ecological footprint is four times larger in high-income countries than in low-income countries.

If everyone on Earth consumed natural resources and emitted carbon dioxide at the same rate as the average American, German or Frenchman, we would need at least another two planets. This method of measuring our dependence on nature is called ecological footprint analysis.



Tread lightly
on the planet!

Instead of measuring how many people the Earth can support, footprints measure the land and water areas that people require to support themselves.

Ecological footprints may include agricultural lands used to produce food, ocean area required to produce seafood, forest areas needed for timber and paper production, and forests that absorb carbon dioxide. Urbanisation, trade, and technology have alienated many of us from natural ecosystems. Ecological footprints reconnect us mentally to Nature and show that we are still dependent on large areas of nature to supply life's basic requirements.

This method underscores the fact that we must not use Nature's productivity more quickly than it can be renewed, or discharge waste more quickly than Nature can absorb it. Footprints have been calculated for cities, regions and countries, as well as organisations and products such as farm-raised fish and tomatoes.

Professor William Rees and Dr. Mathis Wackernagel coined the term "ecological footprint analysis" in the early 1990's. They were inspired by the work of American ecologist Eugene Odum and Swedish ecologist Georg Borgström in the 1960's.

Footprints show the inequities between rich and poor

The ecological footprint of an average consumer in the industrialised world is about four times that of an average consumer in less industrialised countries. A new book, *Sharing Nature's Interest*, calculates that each person in the UK requires an area roughly equivalent to 6 soccer fields to provide for his current levels of consumption and absorb his wastes. The average North American requires almost twice this area, whereas the average Mexican gets by on less than half the "UK footprint." If we divide all the land in the world among all the people in the world, we

get an average "earth share" of around 3 soccer fields. However, many developed countries have footprints larger than their own land area, and "borrow" land and resources from the developing regions. Despite this, countries with high material standards and high GNP's are often described as economic success stories and examples for developing countries to follow.

In other words, most developed economies are overpopulated in ecological terms. Imagine what would happen to a wealthy urban region if it were enclosed in a glass dome, completely isolated from natural flows. The ecosystems contained within this imaginary human terrarium would be too small to provide necessary resources and waste sinks.

Use footprints with caution

Ecological footprint analysis is a clear communication tool that has helped to spread the science of sustainability to the general public and to decision-makers. Several scientists have, however, highlighted the danger of viewing footprints as an ultimate and objective decision-making tool. To begin with, footprint calculations often leave out several things for which data are incomplete, such as water consumption and the release of toxic pollutants. This means that the results underestimate humanity's full impact on and dependence upon Nature.

Moreover, an ecological footprint is a static measure of an area - a snapshot. It does not take into account what happens over time within that area. If we calculate the area of forests that a city needs, it is only an estimate of current needs. But forests can suffer from fire or storm damage. After such a disturbance, their capacity to produce timber and paper and absorb carbon dioxide is significantly reduced. Whether or not the forest will become productive again depends on both the diversity of plants and animals within the damaged forest, and on its proximity to a healthy forest that can export seeds and pollen to the

damaged area. Consequently, footprints do not describe how viable or vulnerable the natural ecosystems providing goods and services are. An isolated forest with very few tree species may very well provide the timber we need and absorb our emissions, but it is extremely vulnerable to disturbance.

Looking inside footprints

Global footprint calculations assume that 12% of the natural environment should be set aside as reserves to protect plant and animal species diversity. This percentage has been heavily criticised as being incomplete and neglecting the need for biodiversity in areas outside reserves. The Millennium Assessment, described in the previous issue of SDU, goes deeper. This international project studies the role of the underlying processes necessary within ecological footprints that allow ecosystems to maintain their capacity to supply goods and services.

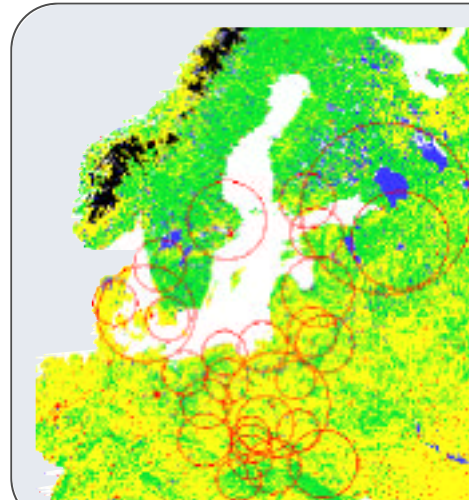
Its limitations notwithstanding, most scientists encourage the use of ecological footprint analysis to illuminate the non-priced and often unperceived work of nature that forms the basis for economic activities. Many international organisations, NGO's and local municipalities already use ecological footprints. One current example that has received much media attention is the Living Planet Report 2000 from the World Wildlife Fund, WWF. It contains ecological footprint calculations for more than 150 countries. You can find the report at: www.panda.org/livingplanet

See also:

Nicky Chambers, Craig Simmons and Mathis Wackernagel, "Sharing Nature's Interest" by Earthscan 2000.

Deutsch, L., and others (2000). "The 'ecological footprint' – communicating human dependence on nature's work." *Ecological Economics* 32:351-355.

Want to read more about footprints? A good Internet site to start with is: www.rprogress.org/programs/sustainability/ef/



The Baltic footprint

The circles in the figure to the left represent the ecological footprints of the 29 largest cities around the Baltic Sea. These cities' Ecological Footprints were calculated to be between 565-1130 times larger than the area of the cities themselves (the figure shows the average footprints). The calculation included the total requirement of land and sea ecosystem area in order to produce wood, paper, fibres, food and to treat waste.

Source:

"Ecosystem appropriation by cities". Folke, C., and others. *Ambio*, Vol 26, No 3, 1997.



Natural ecosystems, like this wetland in the Everglades in the USA, can protect us from the effects of natural disturbance such as coastal storms.

More people are now displaced by natural disasters than by conflict. And there is increasing evidence that many natural disasters are no longer natural. One way to avoid this is by promoting resilience.

Natural disasters caused by storms, fire and flooding have become more common in recent years. More people worldwide are now displaced by natural disasters than by conflict, according to a recent report from the Worldwatch Institute.

This is because we have altered many natural systems so much that their ability to protect us from disturbance is greatly diminished, and also because human population growth has forced people and economic activities to settle in vulnerable areas.

Moreover, human-induced climate change seems to have increased the number of extreme weather events. In the

1990's, natural catastrophes affected more than two billion people at a cost of more than \$608 billion.

Poor most vulnerable

Often the poor are most affected by natural catastrophes, since they tend to live in areas more prone to droughts, floods or landslides. Between 1985 and 1999, 96 percent of recorded disasters occurred in developing countries, which seldom have the economic resources to deal with their effects.

It is not only humans who are vulnerable to natural catastrophes. According to recent research, many of the world's ecosystems have become more susceptible to sudden events such as weather extremes and fires. This is a consequence of long term gradual changes in for example climate, biodiversity and nutrient loading, reports an international group of scientists in the journal *Nature*.

Using examples from a variety of ecosystems, from coral reefs and tropical

forests to northern lakes and forests, they demonstrate that stressed ecosystems can shift rapidly from a seemingly steady state to a state of ecological collapse, like the straw that broke the camel's back. Such state shifts, they write, can incur "large losses of ecological and economic resources" and often without early warning signals. Once the immediate effects of the disturbance subside, the weakened ecosystem may not shift back again.

But there is hope. Strategies that focus on the capacity of ecosystems to cope with disturbance without shifting to another state (a capacity called "resilience") can help anticipate and avoid catastrophic change, say the authors.

A win-win situation

By maintaining ecosystems' capacity to cope with disturbances (their resilience) we are also preserving their ability to protect us. Dunes, barrier islands, mangrove forests and coastal wetlands protect human settlements from coastal storms. Forests, floodplains, and wetlands are "sponges" that absorb floodwaters.

In short, protecting ecosystems helps ecosystems protect us. This is especially important to the poor who do not have the economic resources to deal with the effects of natural disasters.

See also:

Worldwatch Paper 158 Unnatural Disasters: www.worldwatch.org/forum/158.html

Scheffer, M., and others, "Catastrophic shifts in ecosystems", *Nature*, Vol. 413, 11 October 2001, pp. 591–596.

Sustainability School:

Ecosystem Services...

are environmental functions that benefit humans, like water and air purification, flood control, erosion control, generation of fertile soils, detoxification of wastes, regulation of climate, pollination, and aesthetic and cultural benefits. Another important ecosystem service is the maintenance of biodiversity, which is critical to agriculture and many industries including pharmaceuticals.

Unlike ecosystem goods like seafood and timber, most ecosystem services are not traded in economic markets. Nevertheless, they are crucial to human well-being and economic development.

The value of ecosystem services should therefore be incorporated into decision-making processes.

More at:

<http://www.esa.org/issues.htm> "Ecosystem Services: Benefits Supplied to Human Societies by Natural Ecosystems" by Gretchen C. Daily and 10 others. *Issues in Ecology 2*, Ecological Society of America.

SDU-In brief

Biodiversity - a crucial issue for the world's poor

Biodiversity – a Crucial Issue for the World's Poorest is a new publication from the UK Department for International Development (DFID).

It is a richly illustrated and easy-to-read 8-page paper that describes the importance of biodiversity to sustainable development.

It is essential reading for anyone interested in general knowledge about the different ways in which poor people benefit from the diversity of life. These include livelihood opportunities, improved nutrition, health, water supply and reduced vulnerability.

It also provides an overview of DFID's work with biodiversity issues, describing strategies that can promote both poverty reduction and sustainable use of natural resources.

More at:

To download the publication for free see: www.dfid.gov.uk/Pubs/files/biodiversity.pdf



DFID's new publication describes how the poor can benefit from sustainable use of biodiversity.

The World Bank focus on the environment

For the first time the World Bank has consolidated its approach to environmental issues into a single environment strategy called Making Sustainable Commitments.

The New Strategy was launched in July 2001 and stresses that environmental concerns must be fully "mainstreamed" into all Bank projects and programs. This reflects a new consensus within the international development community that environmental issues are a critical component of world development goals.

The new strategy focuses on finding ways to ensure that economic growth does not jeopardise people's health and future opportunities by causing pollution and degraded natural resources and ecosystems.

"One of the key lessons... is that we have to consider the environment as a part of development rather than a self-standing agenda," said Kristalina Georgieva, Director of the World Bank Environment Department.

Ian Johnson, Vice President of Environmentally and Socially Sustainable Development at the World Bank, sees a bright future ahead:

"We have a very real chance of reducing poverty, and doing so in a manner consistent with a clear social and environmental conscience".

More at:

<http://lnweb18.worldbank.org/essd/essd.nsf/EnvironmentStrategy/Brochure-home>

UNEP opens freshwater portal

The United Nations Environment Programme (UNEP) has opened a new online gateway to information about the declining quantity and quality of the world's freshwater resources, which according to UNEP "may prove to be the dominant issue on the environment and development agenda of the coming century".

Lack of water is already a major constraint to socio-economic development in many areas, including Africa, West Asia, China, India and Indonesia. By the year 2025, two out of every three people may live in water-stressed conditions.

The portal includes documents, databases, maps and graphics. It is divided into 9 key issues: Water scarcity, Irrigated agriculture, Water and sanitation, Water quality, Groundwater, Transboundary water management, Water and ecosystems, Floods and droughts and Urban water. The Freshwater Portal is produced by the UNEP Net information system, a network of cooperating centres facilitating access to environmental information from a broad range of information and data providers.

More at: <http://freshwater.unep.net/>



Lack of water – a major constraint to socio-economic development. Photo by UNEP.

Genetically Modified Organisms - capacity building in developing countries

The UN has launched a worldwide project to help developing countries assess potential risks and rewards from genetically engineered crops. Sida will also fund capacity building in the area, according to a new discussion paper.



The genetically modified "Golden Rice" that contains Vitamin A could save millions of children from malnutrition and blindness.

UNEP (The United Nations Environment Programme) has launched a multi-million dollar project to help developing countries assess the risks and benefits of using Genetically Modified Organisms (GMO's). The project will assist almost 100 countries in developing scientific and legal skills for evaluating health and environmental issues surrounding GMO imports. This will help these countries prepare for the entry into force of the Cartagena Protocol on Biosafety, which was adopted in January 2000.

The question of whether or not promoting genetically modified crops is a good way to alleviate hunger is also discussed in a new discussion paper from Sida, the Swedish

International Development Cooperation Agency. The new technology might boost yields and be a good thing for the poor, says the paper. For instance, "golden rice", which has been genetically engineered to contain vitamin A, could save millions of children from hunger and blindness. However, the environmental consequences of introducing this new species are unclear. The introduction of GMO's must take ecological, economic and cultural factors into consideration. The benefits of genetically modified crops should also be compared to those of alternative methods of agricultural intensification and increasing vitamin A intake.

Sida focuses on capacity building

It is also emphasised that poor countries should share the benefits of the utilisation of their own genetic resources if they are used by gene technology companies in developed countries. Moreover, there is a risk that poor people will become too dependent on expensive high-tech seeds, and that varieties of crops adapted to local conditions will be out-competed.

The discussion paper also considers health risks such as new allergies and the risk that transgenic crops might require new pesticides. Sida concludes that it is important to support capacity building, in particular focused on increasing local knowledge about GMO's in developing countries.

Ecological risks from the spread of GMO's into the natural environment are also addressed. Another resource for those interested in the ecological consequences of GMO's is Conservation Ecology's special issue on the subject. (Conservation Ecology is an Internet-based scientific journal at www.consecol.org) Both the Sida paper and the special issue conclude that we know far too little about the secondary effects of GMO's on ecosystems.

More at:

www.unep.org

www.consecol.org/Journal/vol4/iss1/art14/index.html

Can genetically modified crops contribute to alleviating hunger in the world? A discussion paper from the Life Group at Sida. Email to info@sida.se if you want a copy.

A book by Danish statistician Bjorn Lomborg challenges the existence or importance of almost every environmental problem you've ever heard of. A number of leading scientists now challenge Lomborg's claims.

In many respects the environment is getting better. We should not worry much about doomsday warnings about the future of the Earth. This is the fundamental assertion of Danish statistician, Bjorn Lomborg in *The Skeptical Environmentalist: Measuring the Real State of the World*. Lomborg accuses scientists of exaggerating environmental problems such as global warming, deforestation, and chemical waste, for their own cynical reasons.

Leading newspapers including the *Washington Post*, the *New York Times*, and the *Economist* gave Lomborg's book considerable positive coverage. However, the book's assertions have now been heavily criticised in distinguished scientific magazines such as *Science*, *Nature* and *Scientific American*. Several leading scientists argue that Lomborg commits the very sins for which he attacks environmentalists: exaggeration, sweeping generalisations, selective use of data and quotations, and even simple errors of fact.

Lomborg argues that by the time elevated temperatures lead to flooding and declining agricultural yields, developing countries will be rich enough to cope with these changes. "Only when we get sufficiently rich can we afford the relative luxury of caring about the environment", claims Lomborg. This ignores the range of conditions and services, mediated by global ecosystems, that form the very basis of our economic wealth.

Lomborg also states that "Economic analyses clearly show that it will be far more expensive to cut carbon-dioxide emissions radically than to pay the costs of adaptation to the increased temperatures." This has prompted considerable critique, since our understanding of the impact of climate change is limited not only by the uncertainties about climate

change itself, but also by even greater uncertainties about ecological, social and political responses to those changes.

Even environmental scientists who have criticised Lomborg agree that material well-being has improved for many people in many places. But they emphasise that it has improved in ways that damage the natural environment. Things must get better in smarter ways.

See also:

"The Skeptical Environmentalist: Measuring the Real State of the World" by Bjorn Lomborg, Cambridge University Press, Cambridge, 2001. 539 pp.

"Misleading Math about the Earth". January 2002 issue of *Scientific American*. Essays by Stephen Schneider, John P. Holdren, John Bongaarts and Thomas Lovejoy.

About Lomborg on the internet**www.lomborg.com**

Bjorn Lomborg's own site where you can download the first chapter of his book.

www.ucsusa.org/environment/lomborg.html

Website of the Union of Concerned Scientists where several leading scientists question Lomborg's book.

www.gristmagazine.com/grist/books

A series of skeptical articles in the *Grist Magazine* that refutes Lomborg's book.

www.wri.org/press/mk_lomborg.html

World Resources Institute urge journalists to exercise caution in reporting on or reviewing Lomborg's book.

www.anti-lomborg.com

Presents alternative views to Lomborg, based mostly on his article in the United Kingdom's *The Guardian*.

State of the World 2002:**"The world needs a global war on poverty and environmental degradation"****The 19th annual edition of The State of the World, Worldwatch Institute's review of the health of the planet and its people, is now available.**

This year's edition reports that the world needs a global war on poverty and environmental degradation that is as aggressive and well funded as the war on terrorism. It includes chapters on climate change, farming, toxic chemicals, sustainable tourism, population, resource conflicts and global governance.

The State of the World focuses on this year's UN World Summit on Sustainable Development (WSSD) in Johannesburg, South Africa. In the foreword, United Nations Secretary-General Kofi Annan stresses the importance of using the occasion of the WSSD to strike a new deal for an economically, socially, and environmentally sustainable world.

The report highlights a number of social and environmental

advances over the last decade, but also describes several setbacks. "Despite the prosperity of the 1990's, the divide between rich and poor is widening in many countries, undermining social and economic stability. And pressures on the world's natural systems, from global warming to the depletion and degradation of resources such as fisheries and fresh water, have further destabilised societies", says Worldwatch President Christopher Flavin.

The Worldwatch Institute is not only focusing on problems, however. As Hilary French, State of the World 2002 Project Director noted,

"Getting the world onto a more environmentally and socially durable course is a daunting task, but history shows that cooperation can overcome even seemingly intractable obstacles".

More at:

For an electronic or a paperback copy of State of the World 2002 go to: www.worldwatch.org/pubs/sow/2002/

About Sustainable Development Update (SDU)

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