

Sustainable Development Update

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

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Issue 2, Volume 5, 2005

“Irrigation can only partly satisfy the thirst for expanded future food production, and agricultural land is shrinking. Global food security in the future requires a new water management approach today”

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Permanent genetic changes threaten future of fish

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“A more sustainable and equitable world is a more secure world”



Read the interview with Michael Renner, co-project leader of this year's State of the World report from Worldwatch Institute.

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“There are many pressing reasons to value ecosystems and the extraordinary range of services they provide [...] They are also, and this is especially true for the poor, the basis of livelihoods from forestry and fishing to farming and tourism. For too long their economic value has been ignored”

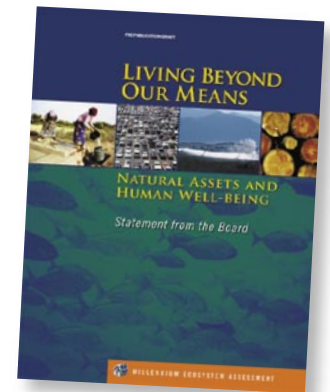
Klaus Toepfer, Executive Director of the United Nations Environment Programme (UNEP), at the launch of the Millennium Ecosystem Assessment.

Healthy ecosystems needed to achieve development goals

The UN-sponsored study, Millennium Ecosystem Assessment (MA), is the most extensive study ever of the linkages between the planet's ecosystems and human well-being.

One of the main messages is that the international community needs to make environmental conservation a top priority if it wants to meet the UN's Millennium Development Goals.

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Editorial:

A severe case of the emperor's new clothes

This year Hans Christian Andersen, the famous Danish fairy tale author, would have turned 200. In his brilliant fairy tale, The Emperor's New Clothes, a king has been duped into believing that he is actually wearing a beautiful costume. Only a young boy has the guts to state the obvious: The emperor is not wearing anything at all - he is naked.

When writing or talking about the linkages between ecological issues and socio-economic development I sometimes feel as if I am that young boy in the tale. This is because my main message is in essence so simple: *we still need nature*. In fact, we who live in the rich part of the world, in our highly urbanised high-tech world, use much more nature than we did in our old agrarian societies of the past. And much more nature than the average person of the poor countries of the South. Even though we have distanced ourselves from nature, we totally rely on the goods and services it delivers. We must get out of this risky illusion that ignores the enormous role of nature for our own well-being.

The UN-sponsored study Millennium Ecosystem Assessment (MA) recently presented its results. It reveals that approximately 60 percent of the ecosystem services that support life on Earth – such as fish production, regulation of natural hazards and water cleansing – are being degraded or used unsustainably. And one of the main

reasons is that our economic system seems to be struck with the same blindness as the emperor. While the economic value of most of nature's goods can be calculated quite easily, many of its services do not appear on conventional balance sheets, even though they are crucial for our own and modern economies' survival. The real worth of this natural capital is often appreciated only when it is lost.

“Whether we like it or not we are naked apes: part of and dependent on nature”

The unique thing about the MA is that it states the obvious in ways that make the emperors of the world listen. We cannot uphold our high standards of living, let alone alleviate poverty, if we don't take care of the life supporting ecosystems. Whether we like it or not we are naked apes: part of and dependent on nature (it doesn't mean we have to behave like animals). No wonder then that I come to think about the old tale, or really, an old song. While reading the MA-study I have had the refrain of a fifteen-year-old song by Irish singer Sinéad O'Connor in the back of my head: “Everyone can see what's going on... maybe it sounds mean/but I really don't think so/you asked for the truth and I told you ... they've got a severe case of/the emperor's new clothes.”

/Dr. Fredrik Moberg, Editor

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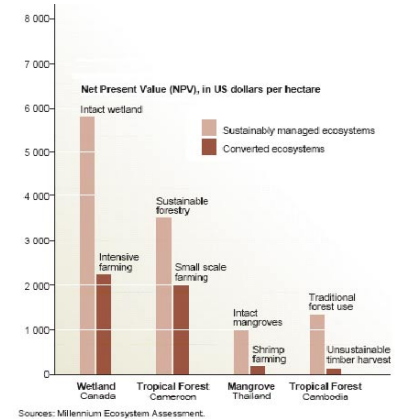
Healthy ecosystems are fundamental for alleviating poverty and achieving sustainable development, according to the Millennium Ecosystem Assessment (MA). One of the main messages of the new UN-sponsored study is that the international community needs to make environmental conservation a top priority if it wants to meet the UN's Millennium Development Goals.

The UN-initiated study, Millennium Ecosystem Assessment (MA), released its Synthesis Report on the 30th of March. It is the first in a series of seven reports that assess the state of global ecosystems and their role for human well-being. Ecosystems provide food, wood, textiles and medicines; they are a source of aesthetic, spiritual, cultural, and recreational values; they support crop pollination, maintenance of water quality and soil fertility, and regulate regional climate, natural

"It is the most extensive study ever of the linkages between the planet's ecosystems and human well-being"

hazards and pests, to name a few. The MA-report's focus on the interactions between social and ecological systems and its findings, should incite decision-makers to incorporate ecological issues in all sectors.

– The Millennium Ecosystem Assessment brings ecosystems back to the heart of development decision-making by documenting how much we gain from nature every day in the form of ecosystem goods and services. They are literally the foundation for the livelihoods of millions of the poorest, said Achim Steiner, director general of the World Conservation Union (IUCN), one of the



Intact and healthy ecosystems are often worth more to society than ecosystems optimised for production of one or a few goods or services. The private benefits are, however, often greater from the converted ecosystem. Photos: Jakob Lundberg and Nils Kautsky.

report's signatories.

The UN launched the MA in order to better understand the consequences of current changes to ecosystems and to evaluate scenarios for the future. The study, spanning the local to the global scale and carried out by 1,360 experts in 95 nations, delivers a stark message to policymakers in developing as well as developed countries.

Time to act now

MA shows how humans have, over the past 50 years, changed ecosystems faster and over larger scales than ever before. This has, for the most part, been done to meet rapidly growing demands for food, fresh water, timber, fibre and fuel, the report says. These changes have helped to improve the lives of billions, but have at the same time weakened ecosystems' capacity to deliver other crucial services. Today, about 60 percent of the ecosystem services that support life on Earth are being degraded or used unsustainably, the report says. Scientists behind the MA warn that, if nothing hap-

pens now, the detrimental consequences of this degradation could become significantly worse in the next 50 years. These consequences affect also the wealthy. This is "fortunate" as these are the social groups and nations that need to make the largest and most immediate changes. Given the scale of human action and impact, it is no longer possible to deal with these issues at a local or national scale. International agreements are essential, and their impacts need to be improved by, for example, co-ordinat-

"Humans have, over the past 50 years, changed ecosystems faster and over larger scales than ever before"

ing between environmental agreements and other international economic and social agreements as well as subsequent enforcement.

The poor worst off

One of the main messages of the report is that the international community needs to make environmental conservation a top priority if it wants to meet the UN's Millennium Development Goals (MDGs).

"Any progress achieved in addressing the goals of poverty and hunger eradication, improved health, and environmental protection is unlikely to be sustained if most of the ecosystem services on which humanity relies continue to be degraded," the report states.

Despite the progress achieved in increasing the production and use of some ecosystem services, levels of poverty remain high, inequities are growing, and many people still do not have a sufficient supply of or access to essential ecosystem services. The poor are generally those most vulnerable to the deterioration of natural systems. The regions facing the

Box 1:

Four main findings of the MA-report:

1. Due to rapidly growing demands for food, freshwater, timber, fibre and fuel, humans have changed ecosystems faster and more extensively in the past 50 years than ever before. About 60 percent of the ecosystem services that support human well-being are being degraded or used unsustainably.
2. The degradation of ecosystem services could get significantly worse during the next 50 years. This will be a barrier to the achievement of the Millennium Development Goals.
3. The changes made to ecosystems have contributed to substantial gains in human well-being and economic development, but these gains have been achieved through the degradation of many ecosystem services, increased risks of abrupt changes, and increased poverty for certain groups of people.
4. Reversing the degradation of ecosystems while meeting increasing demands for their services is a challenge. It can be partially met in the future, but requires substantial changes in policy, institutions and practice.

4

worst problems of ecosystem degradation – sub-Saharan Africa, Central Asia, some regions in Latin America, and parts of South and Southeast Asia – are also those having the greatest difficulties in achieving the MDGs. For example, the number of poor people in Sub-Saharan Africa is predicted to rise from 315 million in 1999 to 404 million by 2015. The conversion of land to agriculture, for example, is unavoidable as the world faces a growing population. The impacts of this conversion will, however, depend on how it is carried out.

– Only by understanding the environment and how it works, can we make the necessary decisions to protect it. Only by valuing all our precious natural and human resources can we hope to build a sustainable future,” said UN Secretary General Kofi Annan, in a message when launching the MA reports.

All four future scenarios explored by the MA predict progress in eliminating hunger, but at too slow a rate to halve the number of people suffering from hunger by 2015. The improvements are slowest in South Asia and sub-Saharan Africa, where the problems are biggest. Environmental conditions, in particular

“Ecosystems and the services they provide are economically far more significant than many realise”

climate change, soil degradation, and water availability, influences this goal through its effect on crop yields and effects on the availability of wild food sources. Moreover, the MA warns that changes in ecosystems such as deforestation is going to influence the abundance of human pathogens like malaria and

cholera, as well as the risk of emergence of new diseases. Malaria accounts for more than 10 percent of the disease burden in Africa. Had it been eliminated 35 years ago, the continent’s gross domestic product would have been \$100 billion larger today.

Including nature’s capital on the balance sheet

A striking result of the MA-study is that ecosystems and the services they provide are economically far more significant than many realise. To damage them is in the long run more or less synonymous to economic suicide.

– I am not one of those who believe everything in this world should be boiled down to dollars and cents. But these es-

“It is cheaper to conserve ecosystems rather than pollute and clean up afterwards”

timated values are a good start and are a useful and additional reason to care for and respect natural capital alongside financial and human capital,” said Klaus Toepfer, Executive Director of the United Nations Environment Programme (UNEP) when attending the launch of the report in Beijing, China.

The report says the costs of degraded ecosystems can be high, and that it is cheaper to conserve them rather than pollute and clean up afterwards. Intact and healthy ecosystems are often worth more than altered ecosystems optimised for production of one or a few goods or services. The private (market) benefits are, however, often greater from the converted ecosystem as the individual’s impacts on the ecosystem are rarely accounted for (see this issue’s Sustain-

ability School) – this is the heart of the problem. The report shows how an intact wetland can be worth \$6,000 per hectare whereas one cleared for intensive agriculture is worth only around \$2,000 per hectare. Similarly, a mangrove forests in Thailand is worth at least \$1,000 per hectare versus about \$200 per hectare when cleared for shrimp aquaculture.

The future can be bright

The media coverage of the MA has tended to emphasise its dark side, that the planet’s ecosystems are under a lot of stress, and that if things don’t change, we’re heading for disaster. But read again: *if* things don’t change. The study, is also positive and includes a chapter on scenarios for the coming fifty years. In fact, of the four scenarios, only one could be called really pessimistic.

Notably, no scenario represents business as usual. Big changes in consumption, better education, new technology and higher prices for exploiting ecosystems could reverse the degradation of many ecosystem services over the next 50 years. One of the main incentives for this to occur is to make world leaders recognise that nature’s services have a value, as protection of ecosystem services is unlikely to be a priority for those who see them as free and limitless. So, things are indeed bad, but not so bad that there’s nothing that we can do about it.

/Fredrik Moberg & Miriam Huitric

More at:

- <http://www.greenfacts.org/ecosystems/index.htm>
- <http://www.millenniumassessment.org/>

Sustainability School: Externalities

Externalities occur when an individual’s actions affect the well being of another in ways that need not be paid for according to existing rules. In recent years the study of externalities by economists has become extensive – not least because of concerns about the link between the economy and the environment.

Ecological externalities are those that impact the environment. Externalities are positive when they benefit society at large and negative when they incur costs.

For example, the full cost of asthma and bronchitis due to air pollution, or the costs of climate change, do not appear in the price of gasoline or on people’s electricity bills. Because the market price of the action does not include a portion of its costs/benefits, normal market incentives lead to positive externalities being under produced and negative externalities being overproduced from society’s point of view.

Ecological externalities often occur because property rights have not been clearly defined or effectively enforced. This means that firms and consumers,

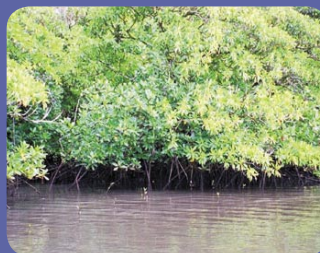
motivated by their own private costs and benefits, can ignore the negative impacts of their pollution on others, leading to excessive levels of pollution.

Taxes, permits or other policies can internalise these costs so the real polluters have to pay the costs they inflict on others.

/Miriam Huitric

More at:

http://www.sectionz.info/Issue_1/hidden_costs.html



Clearing of mangroves for intensive tiger prawn farming disrupts the flow of many ecosystem goods and services though farmers do not pay for this loss.

"A more sustainable and equitable world is a more secure world"

Terrorism is merely a symptom of global insecurity, not a cause. Poverty, disease and environmental decline are the "true axis of evil", according to the Worldwatch Institute. A more sustainable and equitable world is a more secure world, says Worldwatch's Michael Renner, the co-project leader of this year's State of the World report that has "redefining global security" as its topic.

What is meant by "security" in this context?



Michael Renner security are very important.

We feel that traditional, military-focused definitions of security are inappropriate to the challenges at hand. Weapons do not necessarily provide security and may actually generate the opposite outcome.

Security needs to be global, rather than national. Security needs to encompass the security (safety and well-being) of individuals and communities, rather than just the security of a state from foreign attack. And closely related to this point, non-military dimensions of security are very important.

What are the greatest specific threats to global security and the security of nations?

Environmental degradation heightens already existing conditions of water scarcity and worsens food insecurity. Infectious diseases (particularly HIV/AIDS in southern Africa) are weakening farm economies, devastating education systems, and ultimately undermine social and political stability.

Climate change sharpens a range of environmental problems and may trigger large-scale population displacements (due to severe and more frequent droughts, storms, and sea-level rise).

Why haven't these threats been treated as security issues before?

Traditional notions of security have strong and influential defenders. The reaction to the September 11 attacks also set back the discussion of what security is all about, reinforcing the notion that military tools can provide security.

How should policy makers respond to the 21st century's security challenges?

Policy makers need to address the major underlying factors of instability (endemic poverty, infectious disease, large-scale population shifts, ecosystem breakdown, and rising competition over natural resources). This means, among other things, a re-prioritization of national budgets—a shift away from military spending.

Should these issues be handled at the national level, or at the international or regional level?

We need action at all of these levels, and we need far better coordination of what is done at these different levels. Rather than reinventing the wheel, we need to make the existing international institutions, including prominently the UN, far more effective. But we need to understand that international organizations can only be as effective as national governments allow them to be.

On a national level, what are the implications for state structures? The implications for foreign and defence policy?

If security policy is not something that is limited to armed forces and defence departments, then it follows that there is a strong need for better integration of policies of a range of government ministries, including development assistance, environment, and others.

Defence and foreign departments are of course typically much better endowed than other government agencies, and so inevitably, there is a question as to who should be in the lead? Strengthening non-military agencies will take major political capital to accomplish.

What are some of the implications for state budgets and international aid?

Governments have given lip-service to the need to increase aid (such as the Monterrey conference on financing sustainable development), but with the exception of Scandinavian governments, they have failed to actually boost their aid budgets. There is no question that aid needs to go up substantially.

What motivations do states have for changing their interpretation of "security"?

The motivation to change the interpretation of security can only come from a growing realization that arguments about the impact of poverty, disease, and environmental degradation are not just academic constructs, but real-life occurrences that will only become more widespread, more frequent, and more severe in coming years and decades.



Are all or most nations similarly at risk from the new security threats?

Without any doubt, poorer nations are at greater risk because their scope of action is more limited and a large portion of their populations are more vulnerable to underlying factors of instability. But it would be a mistake to assume that any nation can insulate itself from these pressures.

/Eric Paglia

More at:

Read the whole interview at: www.albaeco.com/sdu

Read more about Worldwatch's view on security and purchase the State of the World 2005 at:

<http://www.worldwatch.org/features/security/>

Eric Paglia is host of the radio show "Think Globally". On the 6th of March they had a special episode on redefining global security (listen at: <http://www.rocket.fm/thinkglobally/thinkglobally.php#archive>)

New research findings show that fishing pressure drives natural selection for smaller fish that grow more slowly. These changes are genetic and therefore hard to reverse. This is hindering the renewal of declining fish stocks.

Fishing pressure is causing fish to evolve to smaller sizes. Being genetic these changes are hard to reverse, hindering the recovery of depleted stocks. This was revealed at the annual meeting of American Association for the Advancement of Science (AAAS), earlier this year. A number of prominent marine scientists highlighted the latest advances in genetics, biology, and evolutionary science and called on managers to incorporate this new understanding into fishing plans.

– By selectively harvesting the largest fish, we end up changing the whole biology – not only growth rates, but egg size, fecundity, feeding behavior... even the number of vertebrae, said David Conover, professor of marine science at the State University of New York at Stony Brook.

Conover's studies show fishing pressures can significantly change the genetic composition of fish populations in as little as 20 to 50 years.

In the long run, sparing the big fish makes more sense than sparing the small ones. In experiments with Atlantic silversides, size-selective fishing altered production by a factor of two in just four generations of fish.

– The scary part is that when we stopped size-selective harvest, the biology didn't change back... it was permanent.

In other words, even if we lower the fishing pressure or quit fishing completely the stocks might not be able to recover as

the genetic variation needed for recovery simply no longer exist. The big, old females not only produce exponentially more eggs than younger, smaller females, but their hearty larvae have a far greater chance of survival. Keeping these big fish in the water increases the chances of strong population numbers in the next generation – which is paramount to the recovery of overfished stocks.

Genes for larger fish must be protected

There is no quick and easy way to integrate all the complexity of fish population dynamics into management, but one thing is for sure: we need to provide refuges from fishing so that the genes for larger, faster-growing fish can be protected. Some areas might be totally protected, some closed seasonally, some open to commercial fishing, some only open for recreational fishing and so on.

So far, the scientists do not know if the new studies are widely applicable to other species. If this is the case, then it isn't a question of doing a better job in managing fisheries, it is a question of doing a different job.

– The longer we ignore these fine-scale processes, the longer it will take for that recovery. And it's not a simple linear relationship - you can cause massive damage in a very short period of time and it can take them much longer to recover, said Andy Rosenberg, of the University of New Hampshire.

– We have been ingenious enough to figure out how to overexploit a very big ocean. We must now be ingenious enough to figure out how to deal with the complexity and regain our lost resources, Rosenberg continued.

/Fredrik Moberg

More at:

<http://newswww.bbc.net.uk/1/hi/sci/tech/4281171.stm>



“Food production is a water challenge”

Food production requires large quantities of water. We need to improve the way we manage water in food production or twice the world's current water consumption will be needed by 2050 to feed the global population, claims a recent report launched by leading scientists at the United Nations Commission on Sustainable Development.

The world produces more food than ever, but it has come with a cost. There has been a drastic reduction of water in a number of rivers and groundwater levels have sunk in many places around the world. There is no water flowing in the Yellow, Colorado and Indus rivers for large parts of the year. Further, previously large lakes, like the Aral Sea and the Chad Sea, are now mere shadows of their former selves.

The ferocious demand for food and other resources from the North, together with the need to lift people from poverty in many parts of the developing world, have led to these dramatic changes. The world is rapidly converting nature into agricultural land to meet growing demands, draining rivers of all water to produce food, and polluting water with pesticides and fertilisers.

These issues are raised in a report by scientists from the Stockholm International Water Institute (SIWI), International Food Policy Research Institute (IFPRI), World Conservation Union (IUCN) and International Water Management Institute (IWMI). The report, *Let It Reign: The New Water Paradigm for Global Food Security*, was produced for the 13th meeting for the Commission for Sustainable Development.

– Irrigation can only partly satisfy the thirst for expanded future food production, and agricultural land is shrinking. Global food security in the future requires a new water management approach today”, says Prof. Jan Lundqvist of Linköping

University (Sweden), one of the authors behind the new report.

Rainfed agriculture the solution?

Other measures have to be taken and the most promising solutions come from rain-fed agriculture.

The idea is to use rain more efficiently. Storage of rainwater is a way to mitigate dry spells. Improvement of the soil is also a way to increase water use efficiency.

A more effective use of precipitation in combination with land care has already led to a doubling of agricultural production in large parts of Africa.

A balanced diet of 3000 kcal (a FAO estimate for 2050) per day requires some 3500 litres of water for its production. This FAO calculation is based on an 80 % vegetable and 20 % animal diet. If this proportion is changed then water requirements will change substantially as it takes 550 litres of water to produce one loaf of bread and roughly 1500 litres to produce 100 grams of grain-fed beef. This means that food consumption trends are very important as they drive the food production trends, and thereby the the food sector's water demand. Our everyday choices in the supermarket are not only choices for a healthy or unhealthy lifestyle, but also have profound impacts on the lives and environments of poor communities far away, according to the report.

/Louise Hård af Segerstad

More at:

<http://www.siw.org>



Traditional management needs updating and governments need to get in touch with their roots

Traditional management systems work but need updating to be effective in the increasingly complex world they are set in. Studies from southern India and Sri Lanka show that two key steps are legitimisation and nesting traditional management into the larger institutional setting.

How can local communities develop rules to manage their local fisheries and reduce their vulnerability to outside effects? Kenton Lobes and Fikret Berkes at the Centre for Community-Based Resource Management (1) have studied this issue in traditional fishery management systems in southern India and Sri Lanka (2). Each fishery organisation has well articulated rules to provide for equity, social responsibility and conflict management among its members. But the lack of legal recognition and cross-scale co-ordination remains a problem at the regional level and may eventually result in an unsustainable fishery.

There are clearly many benefits for fishers from forming a fishing organisation and from governments' point of view, self-enforcing management systems reduce their monitoring and enforcement costs.

High-value shrimp mean new challenges

The authors warn that while these traditional systems have dealt with the complexity of their fisheries at the local scale and been very resilient over time, they are now set in a much more complex world. This is especially true of high value and tradable resources like shrimp, which attract many users. If these systems do not adapt to this reality, they are very vulnerable to its larger-scale processes working beyond local grounds.

"There is pressure on the fishery from non-locals, and conflict has increased steadily since the boom in shrimp markets in the 1970s."

Lobe and Berkes identified two factors that allow organisations to deal with these issues: Legitimation empowers organisations to enforce their rules both on members and intruders, without this their grounds are legally open to other users. The second factor is nestedness. As the



Shrimps drying in the sun. Photo: FAO

complexity of users increases, so too does the complexity of the issues that arise: conflicts between local organisations, and with other user groups and the government. These issues are often impractical or too complex for local organisations to deal with. Umbrella groups among local organisations were crucial for dealing with these larger scale processes.

Lobes and Berkes demonstrate that all three levels: local organisations, umbrella groups and the government are needed to deal with regional scale processes, which are pretty much the norm in today's globalised world. Communities around the world have shown great knowledge and ingenuity in confronting resource use issues. Authorities need to show the same adaptability. Neither a top-down nor a local-level approach alone will work.

/Miriam Huitric

(1) www.umanitoba.ca/institutes/natural_resources/nri_cbrm.html

(2) Lobe & Berkes. 2003. The *padu* system of community-based fisheries management: change and local institutional innovation in south India. *Marine Policy* 28: 171-281.

Scientific consensus: biodiversity matters to human well-being

Humans are causing increased rates of species invasions and species extinctions. These changes cause concern for ethical and aesthetic reasons, but they also alter the flow of goods and services ecosystems provide to humanity. This is concluded in a recent report from one of the most prominent scientific organisations in the world, the Ecological Society of America (ESA). Alongside the much publicised Millennium Ecosystem Assessment report (see main article), this furthers the scientific community's consensus on the crucial role of biodiversity for ecosystem functioning and human welfare.

There are several well-documented cases where species invasions and extinctions caused by human activities have altered the flow of ecosystem goods and services. The unfortunate crux is that many of these changes are difficult, expensive, or impossible to reverse or fix with technological solutions. Protecting biodiversity while promoting social and economic development, particularly in the developing world, is therefore one of the biggest challenges for the future.

Source: Hooper and others. 2005. Effects of biodiversity on ecosystem functioning: A consensus of current knowledge. *Ecological Monographs* 75 (1): 3-35

Vulnerability analysis an important part of poverty reduction strategies

Loss of resources or access to other assets due to a disaster or chronic stress can move people from stable better-off positions to temporal, seasonal or chronic poverty. This is why vulnerability reduction strategies need to be integrated into poverty reduction plans.

In the *Poverty and Vulnerability Programme*, the Stockholm Environment Institute (SEI) undertakes vulnerability analyses and work to have them incorporated into poverty reduction strategies. Vulnerability is the extent to which people or systems risk being harmed by environmental or socio-economic perturbations or stress.

Vulnerability and poverty are different things but if vulnerability is high then there is a larger risk for poverty. A vulnerability analysis looks at patterns of exposure, sensitivity, and resilience.

SEI has recently published vulnerability profiles for Mali, Burkina Faso and the West African Region. One of the most important steps identified for decreasing vulnerability is diversifying income and resources. This allows for flexibility which is the key characteristic of successful vulnerability reduction.

More at: <http://www.sei.se/risk/poverty.html>



The Sustainable Development Update focuses on the links between ecology, society and the economy. It is produced by Albaeco, an independent non-profit organisation, in cooperation with the Center for Transdisciplinary Environmental Research (CTM) and the Department of Systems Ecology, both at Stockholm University; the Beijer International Institute of Ecological Economics; the Resilience Alliance; and the Stockholm Environment Institute (SEI). It is produced with support from Sida, the Swedish International Development Cooperation Agency, Environment Policy Division. **Feedback:**

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