

The Price Of Survival

How Much It Costs To Save Nature

At a global conference in Bonn, Germany, representatives of 191 nations are discussing a revolution in conservation. By making a highly profitable business out of saving forests, whales and coral reefs, environmentalists hope to put a stop to a dramatic wave of extinctions.

By Philip Bethge, Rafaela von Bredow and Christian Schwägerl

The envoy from Europe can hardly believe his eyes. Butterflies the size of dessert plates are fluttering around his nose. Orchids hang in cascades from towering trees. Hornbills sail across the treetops. The tropical air is filled with the saturated scent of growth and proliferation.

Biologists have already tracked down more than 10,000 plant and 400 mammal species in the Congo basin. These plants and animals are part of the world's second-largest uninterrupted rainforest, one of the planet's most potent carbon storage systems. Indeed, it is for precisely this reason that Hans Schipulle, 63, is tramping around in the wilderness near the Sangha River on a humid morning in the Central African Republic.

"This forest stores carbon dioxide, and thus helps to slow down global warming. It regulates the global water supply and holds valuable pharmaceuticals," says Schipulle, a veteran environmentalist who works for the German government. "We must finally realize that these are services that are worth something to us."

Schipulle is in the region on a sensitive mission. Since December, he has headed the Congo Basin Forest Partnership (CBFP), a group founded by Americans, Europeans and the countries along the Congo River. The alliance aims to prevent the Congo basin from

providing the community with about €10,000 (\$15,500) in annual revenue -- but not enough to reduce poverty.

But for many environmental protection groups, the deal is merely another nail in the coffin for the Amazon rainforest.

In addition, the destruction of nature and global warming tend to reinforce one another. When sea levels rise and mangrove forests disappear, coastlines become more exposed to the elements than ever before. As carbon dioxide continues to acidify the oceans, the

the conference next Wednesday. Norway, which invests \$500 million (€323 million) a year, is her benchmark. Back home, the government in Berlin is urging German states, responsible for domestic environmental protection issues, to allow 10 percent of forests owned by states and municipalities to return to nature.

Environment Minister Gabriel also plans to present the initial results of a study, initiated in collaboration with the European Union, on the global costs of species and habitat loss. According to an excerpt SPIEGEL has obtained of the document -- titled "The Economics of Ecosystems and Biodiversity" -- the loss of biodiversity costs the world 6 percent of global gross domestic product. Poor countries are the hardest-hit. The annual cost of species and habitat loss amounts to as much as half of their already modest economic strength.

"Protecting diversity is much cheaper than allowing its destruction," says Indian economist Pavan Sukhdev, who Gabriel and EU Environment Commissioner Stavros Dimas convinced to head the study. Biodiversity -- and efforts to preserve it -- could in fact become an enormous business in the future. The new conservationists hope to sell intact forests because they store the greenhouse gas carbon dioxide (CO₂). They also expect to see drugs developed from creatures like the cone snail and corals produce handsome profits in the future. The last oases of diversity are also expected to attract more and more well-heeled eco-tourists.

"Bonn has to push for a breakthrough," says Achim Steiner, the head of the United Nations Environment Program (UNEP). To this day, according to Steiner, the promises made at the Earth Summit in Rio de Janeiro 16 years ago, where both the Framework Convention on Climate Change and the Convention on Biological Diversity were born, have "not been kept or have been systematically broken."

Biodiversity is more than just the diversity of plant and animal species. It also encompasses the entire cornucopia of habitats, as well as the genetic information that lies hidden, as a biological treasure, in many organisms that have yet to be studied. Experts estimate that the planet's inventory includes between 10 and 20 million species of animals, plants, fungi and microbes. This diversity is not evenly distributed, however. Life is concentrated in so-called hot spots, which include regions like the Mediterranean coast, the tropical Andes and the Philippines.

And the future of diversity is not bright. Take Germany(e)-5(C brigmic5(aahey als03 Tw 16.625 0 T

To make matters worse, the rate of decline is formidable. A current UNEP estimate concludes that species are becoming extinct 100 times faster today than would normally occur as a result of evolution.

"A sixth global mass extinction has begun," says UNEP Executive Director Steiner. The diversity of species has already been severely compromised five times in the past in the wake of meteorite collisions, volcanic eruptions and rising sea levels. But today it is the

revenue. The group's calculations reflected the reserves' economic benefits for tourism, climate protection, nutrient cycles and the water supply.

If the destruction of natural habitats continues unabated, even the key to the earth's future energy supply could go undiscovered. US geneticist Craig Venter has collected thousands of samples of microorganisms living in seawater during voyages on his yacht, the *Sorcerer II*. Venter hopes that the samples will contain genetic sequences that could be used to produce fuels for cars and airplanes in the future.

In 1997, American ecological economist Robert Costanza estimated the annual value of the services nature provides for mankind at \$33 trillion, a figure that was 1.8 times the world GNP at the time.

A Shift in Thinking

Despite their enormity, these numbers have been of little use to species and ecosystems in the past, because few have been willing to pay money for nature's assets. Indeed, the world's powerful corporations continue to treat animals, plants, forests, rivers and wetlands as a free resource. But at least some industries seem to be approaching an important watershed moment.

For instance, companies already earn \$43 billion (€28 billion) in annual revenues with plant-based natural remedies. The active agents in 10 of the world's 25 most successful drugs were originally derived from fungi, bacteria, plants and animals living in the wild. The precursors of aspirin came

like a cowboy wielding his Colt, then deftly cuts off the seed heads: a small snip for Vargas, but could it be a giant snip for mankind?

"Many of the fungi that live in the leaves of this plant have never been studied, because they are so hard to isolate," says Vargas. "They may very well produce many interesting substances with which we aren't even familiar yet."

Since INBio was established in the late 1980s, its scientists have examined thousands of insects in their quest for useful natural substances. Nowadays, the high-tech equipment at the institute's special laboratory in Heredia, a San José suburb, is used mainly to analyze plant extracts, microbes and fungi.

The great bio-boom has not materialized yet, prompting Merck and a few other major investors to withdraw their funding. "The pharmaceutical companies no longer want to pay for the long process that is needed to find promising substances in nature," says Giselle Tamayo, technical coordinator of INBio's biodiversity prospecting division.

Sharing the Blessings, While Protecting Biodiversity

Nevertheless, Tamayo insists that the research facility, which now works primarily with universities, is still "a model of success." The institute, says Tamayo, helps to demonstrate how developing countries can share in the blessings of biotechnology while simultaneously protecting their own biodiversity. A share of the licensing fees INBio receives goes into protecting Costa Rican forests.

Costa Rica is already considered a model country within the international conservation movement. In the country's booming ecotourism industry, about 1.5 million tourists spend close to \$1.5 billion (€970 million) a year to visit the natural wonders of Costa Rica's rainforests and montane forests. And protecting those forests has been elevated to a national doctrine in Costa Rica. In the 1970s and 1980s, loggers cleared almost 80 percent of the Costa Rican rainforest. Today more than half of the country is forested once BDC 7 Td

The program is funded with taxes on the sale of gasoline and funds from the World Bank and the Global Environment Facility, into which the CBD member states pay. But Costa Rica also hopes to turn a profit in the future from the carbon dioxide captured by trees.

Indeed, the ability to capture enormous amounts of CO₂ from the atmosphere and store it could ultimately be forests' lifeline in this era when man is desperately searching for ways to halt global warming. Bogs can also bind substantial amounts of CO₂. Restoring and preserving them "offers a cost-effective way of curbing climate change and protecting diversity," says UNEP Executive Director Steiner. This is also an opportunity for Germany. Researchers at Greifswald University have calculated that restoring one hectare of lowland bog in Germany and allowing the native alder forest to grow results in the capture of 30 tons of CO₂ a year.

The governments of countries with large tropical rainforests, like Guyana, Indonesia, Brazil and Papua-New Guinea, have become especially enthusiastic advocates of the revolutionary idea of selling their forests as greenhouse gas sinks. If the plan works, they could rake in billions in profits, which in turn could be spent on protecting forests.

A New Currency for Environmentalism

The currency in the new environmental age is called a "forest certificate," and a potential market for the green money already exists. In the EU emissions trading system, for example, industrial corporations and energy utilities are allocated carbon dioxide pollution rights known as CO₂ certificates. They define 4dmor Gestoring

p04 '0

Turning Canopies into Capital

In Brazil, the chainsaw is still winning out over conservation. Almost 20 percent of the country's 3.65 million square kilometers (1.41 million square miles) of Amazon rainforest have already been cut down and turned into pastureland and soybean fields. After taking office in 2003, Brazilian Environment Minister Marina Silva managed to reduce the rate of deforestation from 28,000 to 12,000 square kilometers (10,810 to 4,633 square miles) a year. She introduced new rules that allowed owners of forests to log on no more than 20 percent of their property, and imposed a credit freeze on violators. But last week Silva, an icon of the global forest protection movement, made the surprising announcement that she was resigning, saying that she was tired of "playing the green fig leaf" for President Lula da Silva.

As it happens, dead forests are more valuable than living forests on global markets, and it will take a lot of money to reverse this. There are, however, a few initial success stories. The World Bank, for example, has introduced its Forest Carbon Partnership, a program designed to protect both the climate and the environment simultaneously. One of the partnership's model projects could soon be that of Germany's Hans Schipulle, who hopes to transform the Congo basin rainforest into a cash cow.

In anticipation of a growing market for forest certificates, the US investment bank Merrill Lynch recently agreed to pay Indonesia's Aceh Province \$9 million (€5.8 million) a year for four years to protect the rainforest in its Ulu Masen preserve. Canopy Capital, a London-based company, has spent a sum numbering in the millions to secure the value that it believes Guyana's Iwokrama rainforest could soon have for mankind. Canopy's managing director, Hylton Murray-Philipson, explains the concept: "No one would pay anything for the intact forest today, but I believe that it is extremely likely that markets will soon take a different view of the value of nature." Experts predict that the trade in the natural assets of forests, bogs and reefs could translate into \$10 billion (€6.5 billion) in revenues by 2010.

Can such global financial transfers truly bring about change? "Once CO2 trading translates into large amounts of money, the question that inevitably arises is who actually owns the forest," says Tom Griffiths, who is with the human rights organization Forest Peoples Programme. "Is it the investors or the people who live in the forest?"

Future Power Struggles over Carbon Sinks

Griffiths fears that a highly profitable forest protection system could lead to power struggles over lucrative carbon sinks, which in turn would translate into more corruption, speculation, land grabs and conflicts. The logging company Asia Pacific Resources International, for example, clears forests and drains peat bogs in Indonesia to plant new tree plantations. Suddenly the company has launched a CO2 pilot project in which it plans to restore a few bogs. But the project smacks of an eco-scam, too, because Asia Pacific will only be able to pocket profits from CO2 trading as a result of the fact that it destroyed large swathes of the ecosystem in the first place.

To secure biological diversity in the long term, the parties to the Biodiversity Convention are also promoting classic methods of conservation. There are roughly 100,000 nature reserves around the globe. According to a recent study by the WWF, the world community spends \$6.5 to \$10 billion (€4.2 to €6.5 billion) a year on protected areas. This sounds like a lot of money, but in fact is well short of what is needed.

marine reserves and few laws govern the high seas. But opinions are gradually changing when it comes to the territorial waters of nations.

A Plan for the Caribbean

The goal of an initiative currently taking shape in the Caribbean, Sea under protec of angingrr

have depended on these facets of nature for their livelihoods are given new opportunities. The solution in the Bahamas is called ecotourism.

Andros is a short, 15-minute flight from Nassau. The island, roughly 170 kilometers (106 miles) long, is home to about 8,000 people and the world's third-largest barrier reef lies off its eastern coast. Islanders like Peter Douglas take the island's few tourists on tours of the colorful, luminescent coral banks and undersea bluffs. Enterprising islanders have developed eco-lodges in the bush behind the coast. Prescott Smith, for example, offers fly-fishing vacations for wealthy business executives. For \$1,600 (€1,030) a day, his customers can learn to elegantly cast their flies in the island's mangrove swamps for longfin bonefish or Atlantic tarpon. But instead of keeping their catch, they adhere to a "catch and release" policy.

The islanders are defending their small paradise against investors in mass tourism. They have found ways to profit from nature without destroying it. "Scientists, governments and the big conservation groups are fighting the locals," says Prescott Smith. "They come here and say: You're the problem." But true conservation, according to Smith, must incorporate the local population. "Only if the people here truly get the feeling that their own interests are at stake will they protect the country."

Indeed, even as the world gathers to discuss the CBD, such small-scale, bottom up projects may be the world's best hope. Such a grassroots approach is especially valid in places where poverty is widespread. The poor have no other choice but to live from the resources of nature and, if necessary, to destroy them. This too is an issue that will be discussed at the Bonn conference in the coming days.

Most of all, however, the CBD partners must attempt to establish a focus for the next two years. The 10th Conference of the Parties of the CBD takes place in 2010, presumably in Japan. By then, the group hopes to have implemented many of its ambitious environmental goals.

"In Bonn, it is especially important that the parties do not block one another on the major

Another bone of contention is the biofuel boom. German Chancellor Merkel did little to ease tensions when she recently signed an energy treaty with Brazilian President Lula da Silva. The Brazilians see German concern for the Amazon rainforest as an attempt to corner the biofuels market. To produce bio-ethanol, they plan to have planted sugarcane in an area almost as large as Great Britain by 2025. "If we tell the Brazilians that we're boycotting this, the negotiations over rainforest protection will come to an abrupt end," warns German Environment Minister Gabriel. Merely the attempt to place the topic of bio-energy on the agenda at the Bonn conference was met with indignation in Brasilia.

The Pricetag of Curtailing Extinction: €30 billion

In short, a high level of diplomatic skill will be needed in Bonn to advance to the core issue: Who will pay how much and for what? The annual cost of curtailing species extinction by 2010 is estimated at €30 billion (\$46.5 billion). The EU heads of state are even more ambitious and want to put a complete stop to the loss of biodiversity in Europe by 2010. However, the WWF believes that this goal can only be reached "at a significant additional cost."

Mastering the crisis will likely require a wide range of funding models. Focusing on biodiversity as a source for new drugs and cosmetics is one possibility, the trade in CO2 certificates is another. Private sponsors can also have an important impact. The conservation group TNC, for example, manages a fortune of \$5.4 billion (€3.5 billion), some of it donated by wealthy patrons. In 2007 alone, TNC spent \$566 million (€365 million) to purchase land and protect it for future generations.

Others have chosen to engage in something akin to colonial megalomania and personally control the fate of nature. Patagonia, for example, appears to be firmly in the hands of billionaires. For years, Douglas and Kris Tompkins, the co-founders of the apparel companies North Face and Patagonia, have owned several thousand square kilometers of untouched wilderness in the region. Some of their neighbors are speculator George Soros, fashion magnates Luciano and Carlo Benetton, actors Sharon Stone and Christopher Lambert, and CNN founder Ted Turner.

The not-quite-fabulously-rich can acquire tropical islands or hectare-sized pieces of wild animal corridors through organizations like TNC or World Land Trust.

Economist Pavan Sukhdev also recommends levying, in addition to the value-added tax, a kind of value reduction tax in wealthy countries -- a way of compensating for the environmental damage associated with the production of a car or a refrigerator. The revenues from such a tax could flow directly into large-scale conservation projects.

Sukhdev also wants to force companies and consumers to assume more responsibility. "A coffee company could charge a small surcharge and invest the money in the rainforest next to its plantations," he says. When it comes to organic food, consumers are already prepared to pay a premium today. "So why not create an Eco-Plus label to test whether they are willing to pay an additional premium to fund conservation projects?"

Nowadays, people can already make their travel climate-neutral by offsetting the emissions from aircraft or rental cars through companies like the German firm global-woods. The company uses the revenues to support reforestation programs in Argentina, Paraguay and Uganda. Another example is the Marriott hotel chain. The company has paid \$2 million (€1.3 million) to the Brazilian state of Amazonas to protect the 589,000-hectare (1.45 million-acre) Juma preserve from loggers. In return, Marriott receives CO2

credits, which are then offered for sale to hotel guests so that they can continue to relax in their hotel saunas without suffering a bad conscience.

Fisheries experts, on the other hand, recommend only buying fish with the Marine Stewardship Council eco-label. Anyone hoping to enjoy eating marine creatures in an environmentally responsible way in the future will have to do without species like halibut or sole. When it comes to wood, most conservationists recognize the certification awarded by the Forest Stewardship Council.

-- its beauty, and its cultural and evolutionary importance -- cannot be estimated, says McCauley. "In the long run, we will achieve more progress if we appeal to human hearts and not their wallets."

In other words, it is up to man to decide what kind of world he wishes to inhabit. Anyone familiar with wilderness knows what will be lost if environmental destruction continues unabated. By the time the world community can agree to a business model to save biodiversity, it could be too late.

We should also consider the need to preserve