

our planet

The magazine of the United Nations Environment Programme — June 2011



ZHOU QIANG
TRANSFORMING
DEVELOPMENT

EMMANUEL ZE MEKA
WELL WORTH PAYING FOR

RAY C. ANDERSON
IT'S NATURE'S WAY

YOLANDA KAKABADSE
FORESTS PRODUCE
GREEN GROWTH

FORESTS

Nature at your service





ZHOU QIANG : Transforming development **PAGE 4**

Increasing forest cover, through continuous effort and co-operation, creates an environmentally-friendly society and boosts investment.



EMMANUEL ZE MEKA : Well worth paying for **PAGE 6**

Managing forests sustainably is viable so long as the goods and service they produce are properly valued and paid for.



FRANCES SEYMOUR : Overused, undervalued **PAGE 8**

It is time to realize the benefits of forests for local communities as well as for the world as a whole.



YEMI KATERERE : Unique opportunity **PAGE 12**

How REDD+ has brought conserving and sustainably managing forests back to centre stage.



SATINDER BINDRA : Something's cooking **PAGE 14**

How improving cookstoves can cut deforestation, save lives and combat climate change.



RAY C ANDERSON : It's nature's way **PAGE 16**

How mimicking the way a forest does things produced runaway business success.



YOLANDA KAKABADSE : Forests produce green growth **PAGE 22**

Reforming how forests are managed will create an environmental and economic win-win.



MARYANNE GRIEG-GRAN AND STEVE BASS : Economies grow on trees **PAGE 26**

Forests can play an important part in the Green Economy, as long as their many benefits are properly valued.



ANDREW W. MITCHELL : Invest in Natural Capital **PAGE 28**

Proactive investment is needed to pay for ecosystem services and thus help save forests.



TENSIE WHELAN : Visit them, conserve them **PAGE 31**

Certifying sustainable tourism can create powerful incentives for conserving forests.

ALSO

reflections **PAGE 3**

books **PAGE 11**

UNEP at work **PAGE 18**

products **PAGE 21**

people **PAGE 24**

awards and events **PAGE 30**

star **PAGE 34**



reflections

ACHIM STEINER

UN Under-Secretary-General and Executive Director, UNEP

This year marks a first for the long standing relationship between India and the United Nations. For the first time ever India will host World Environment Day (WED). With a population of 1.2 billion people, a rapidly growing economy and a diverse cultural past, present and future there is enormous potential for India to catalyze and to champion sustainable development nationally and internationally.

This year's WED theme is 'Forests: Nature at Your Service'. It speaks to the intrinsic connection between livelihoods and human well being and the health of forests and forest ecosystems.

India has shown leadership by, for example, instituting a tree-planting system to combat land-degradation and desertification, including windbreaks and shelterbelts to protect agricultural land. The recently launched Mission for Green India, as part of National Action Plan on Climate Change, aims at qualitative as well as quantitative improvement in forest cover over 10 million hectares, with an estimated outlay of about US\$10 billion over the next 10 years.

India has successfully introduced projects that track the health of the nation's plants, animals, water and other natural resources including the Sunderbans — the largest deltaic mangrove forest in the world, and home to one of India's most iconic wildlife species: the tiger.

Meanwhile the country is increasingly at the forefront of some of the 'green shoots' of a Green Economy that are emerging across the globe.

From its manufacturing of solar and wind turbines to its Rural Employment Guarantee Act which underwrites paid work for millions of households via investments in areas ranging from water conservation to sustainable land management, foundations are being laid in India towards a fundamental and far reaching new development path..

UNEP's recent report — A Transition to a Green Economy: Pathways to Sustainable Development and Poverty Eradication underlines that such a transition not only possible but relevant to developing nations as it is to developed ones.

WED 2011 comes in advance of the UN Conference on Sustainable Development 2012 or Rio+20. Its twin themes are the Green Economy within the context of sustainable development and poverty eradication and an institutional framework for sustainable development.

Rio+20 comes against a backdrop of rapidly diminishing natural resources and accelerating environmental change — from the loss of coral reefs and forests to the rising scarcity of productive land; from the urgent need to feed and fuel economies and the likely impacts of unchecked climate change.

India is among a range of nations spotlighting different choices that represent an opportunity to fulfil the promise of the 1992 Rio Earth Summit in order to deliver development that meets the needs of seven billion people, rising to nine billion by 2050.

One that delivers growth, greater equity and employment opportunities: one that keeps humanity's footprint within planetary boundaries in order to ensure that Nature can remain at our service for current and future generations.



JAIRAM RAMESH

Minister for Environment and Forests, India

“We need a strong ethic of conservation and in this role, World Environment Day is a powerful catalyst and voice. There must be limits on how and where we encroach on the natural world for without them habitats will be paved over, rivers ruined, corals bleached and forests unwittingly plowed for agriculture.”



ZHOU QIANG

Party Secretary of Hunan Province and
UNEP Champion of the Earth

TRANSFORMING DEVELOPMENT

Adopting a sustainable approach that both satisfies a society's economic dynamics and protects the ecological environment has become a major international challenge. We in the province of Hunan, in central China, are determined to meet it, and will work with others across the world to do so.

Hunan is blessed with a high level of forest cover, along with an optimal climate and abundant rainfall — but it faces great environmental stresses with rapid industrialization and urbanization. In recent years, it has actively responded to calls to manage forests so as to increase their role as carbon sinks and partially counteract emissions of carbon dioxide covered by the Kyoto Protocol. In line with the Chinese Government's requirements and action to accelerate the transformation of the country's mode of development, Hunan's basic principle and aim is green, low-carbon and sustainable economic and social development. Accordingly, we comprehensively are promoting a new style of industrialization, agricultural modernization,

*“We are aiming to
construct a resource-saving
and environment-friendly
society, focusing on
building a ‘Green Hunan’.*

and urbanization. We are aiming to construct a resource-saving and environment-friendly society, focusing on building a ‘Green Hunan’.

Leading the people to love trees and forests is an essential part of this. For over 30 years, provincial leaders have been in the forefront both of voluntary tree planting and of mobilizing people throughout Hunan to engage in it — thus creating a multi-agent and multi-level afforestation programme. Zhangjiajie, a city in northwestern Hunan, has held the China International Forest Protection Festival — with the theme ‘Green for the Earth and Forests for Humanity’ for 14 consecutive years. It is not only one of China’s ten ecological festivals, but the only one featuring ‘forest protection’ as its theme.

“Those who own some properties and have greater perseverance”, as the ancient Chinese Scholar Mencius put it, “tend to plan both production and their livelihoods in a systematic way”. Since 2008 Hunan has been vigorously promoting the reform of the system of collective forest rights so as to protect the interests of tree farmers and entice them into both planting trees and protecting forests. As a result, they can all receive forestry land use certificates clarifying ownership and are encouraged to manage the land under contracts so that they can benefit from the orderly cutting of their own trees. This undertaking

*Leading the people to
love trees and forests is an
essential part of this.”*

has greatly stimulated farmers’ enthusiasm: many treat trees tenderly like grain seedlings and are willing to plant them wherever there is empty unused land.

We are also determined to strengthen the environmental protection of forest in cities to counteract the effects of wood chopping and requisition of forest land during rapid urbanization. In addition, the province is making the Changsha-Zhuzhou-Xiangtan (CZT) city cluster a Vienna Forest — with tree cover greater than 45%— enacting legislation to safeguard Zhaoshan Mountain, the green heart of the city cluster, and protecting the core area by making it a pilot of a resource-conserving and environmentally-friendly society.

We are also attempting to turn the Xiangjiang River into an Oriental Rhine through comprehensive treatment of both it and Dongting Lake and by constructing a Xiangjiang River Scenic Belt. As a result, the CZT’s core ecological district will be in good custody, forest coverage will be increased and the wetlands of the Yangtze, Xiangjiang and other rivers will be conserved and well-protected.

Continuous efforts in building “Green Hunan” have yielded remarkable achievements. The forest land area of Hunan has reached 193 million mu (about 12.87 million hectares), with the addition of a total 402 million cubic meters of storage volume. Forest cover amounts to over 50%, and it absorbs 60 million tons of carbon dioxide annually. At the same time, over 90% of the province’s surface water meets drinking water standards, and the air of all its cities and prefectures has achieved the Second National Ambient Air Quality Standard. This ecological environment has attracted many well-known enterprises — both domestic and foreign — to invest in Hunan, in turn promoting rapid and sound social and economic development.

Achieving sustainable development calls for in-depth cooperation and joint efforts. These have global significance. Over recent years, for example, the Indonesian Government has adjusted its development strategy to enhance the protection of tropical rainforests, and it plans to plant 1.5 billion trees each year. This has enlightened our vision of building a ‘Green Hunan’. In turn, we are willing to share the experience we have gained in such fields such as forest protection and sustainable development with Indonesia and other countries and to further promote mutual exchange and cooperation in protecting the earth — the common homeland of humanity.



Well worth paying for



EMMANUEL ZE MEKA

Executive Director,
International Tropical Timber Organization

Many studies — such as UNEP’s *The Economics of Ecosystems and Biodiversity* — have recently reported on the high ecosystem service values associated with forests, especially tropical ones. They have found that the values of water, carbon storage, soils, biodiversity maintenance and other forest ecosystem functions dwarf the economic value of traditional forest products (primarily timber). This leads to forests being valued at billions — or, globally, trillions — of dollars. Nevertheless, about 13 million hectares of tropical forests continued to be lost — along with their valuable biodiversity and other ecosystem services — every year from 2000 to 2010. How could this be?

There is a simple answer. While the ecosystem services catalogued and assessed in recent reports, using sophisticated economic techniques, are indeed valuable, the markets for transferring payments for them mostly remain in their infancy — if, indeed they exist at all. With the exception of the emerging global market for carbon, there are no mechanisms for tropical countries to monetize the potential value of their forests. No one is lining up to pay them for these services. So it is not surprising that forest owners (mostly countries but sometimes also the private sector) decide to use the land on which those forests sit for what they perceive to be more productive economic uses, such as agriculture.

ITTO — an intergovernmental organization based in Yokohama, Japan — began life a quarter of a century ago as a commodity organization focused on promoting markets for sustainably produced tropical timber. This objective is still relevant, but the Organization has increasingly sought to help countries manage their forests sustainably and add value to all tropical forest services; it recognises that the revenue from any one service is simply insufficient to offset benefits from such competing land-uses as agricultural crops or oil palm, with their relatively short harvest cycles and simpler management regimes.

Timber remains the single most important way of generating revenue from tropical forests. It has earned tropical countries over \$20 billion in export earnings annually over the last decade, if both primary and secondary processed products (like furniture) are taken into account. Indeed the forest sector's contribution to economic development is even greater when the millions of jobs it creates and the revenues generated by domestic timber markets are also considered. Sustainable forestry and sustainably produced timber products must therefore be a part of the solution both to valuing tropical forests appropriately and to reversing their continuing clearance while simultaneously promoting economic development. So ITTO continues to argue that it is essential that the new funding schemes being formulated to combat climate change (such as "REDD+" or Reducing Emissions from Deforestation and Forest Degradation) include sustainable forestry — incorporating sustainable timber production — within their approved activities.

There is a wealth of experience — some of it generated from ITTO field projects — on how to produce timber and other forest products

“Sustainable forestry and sustainably produced timber products must be a part of the solution both to valuing tropical forests appropriately and to reversing their continuing clearance while simultaneously promoting economic development.”

sustainably — by taking the ecology of the tree species into account, using technology to reduce the impact of harvesting, undertaking appropriate rehabilitation and/or reforestation afterwards, and providing market information to ensure the resulting products are fairly priced, so that funds can flow back to the forest. Of course corruption and poor governance — which affect many sectors and countries — need to be tackled to allow the system to work and to ensure funds are not misappropriated: significant work on tackling such problems has been undertaken globally in recent years.

ITTO has tracked progress towards sustainable forest management (SFM) in the tropics since its formation. One of the Organization's first studies (published as the 1989 book “No Timber without Trees”; by Duncan Poore) found that only a miniscule amount of the world's tropical forest was under sustainable management in the late 1980s. A follow up study — ITTO's Status of Tropical Forest Management 2005 — found that, though there had been improvements, the area under SFM was still only around 5% of what was

intended to be kept as forest, both for production and for protection, in tropical countries. ITTO's most recent survey — Status of Tropical Forest Management 2011 — finds that progress has continued over the past five years: well over three million hectares a year has been added to the total area under SFM in the tropics. However this still leaves over 90% of the world's tropical forests under poor or no management. Clearly, progress in SFM needs to accelerate to meet our shared goal of ensuring the future of global tropical forest resources.

UNEP — as the key UN agency charged with promoting environmental sustainability — shares a special concern for tropical forests and their ecosystem values, and they have a high profile on the lead-up to next year's Rio+20 Earth Summit. It is worth recalling, however, that many stakeholders (especially the developing countries where virtually all tropical forests exist) were disappointed with the lack of “new and additional” resources that the international community was expected to make available to implement the non-binding forest principles agreed during the original 1992 Earth Summit. In the nearly two decades since that historic event many services provided by tropical forests — including ecotourism, bio-prospecting, and most recently REDD and carbon — have been identified as having the potential to reverse their continued loss. Organizations like ITTO and UNEP must work with governments, NGOs, the private sector and other stakeholders to develop fair and equitable markets for these and other forest products and services. In this way, we can help to send the global community a clear message that managing tropical forests sustainably is a viable land-use option — provided that we properly value and pay for the many goods and services they produce.



Overused, undervalued



FRANCES SEYMOUR

.....
Director-General,
Center for International Forestry Research

This should be a banner year for the world's forests. 2011, the United Nation's International Year of Forests, was preceded by the auspicious agreement on reducing emissions from deforestation and forest degradation (REDD) at December's UNFCCC's COP16 in Cancun, launching a long-sought mechanism to integrate forests into the global climate protection regime.

The world's forests should also be well positioned to take advantage of the need to shift to a "green economy". We have long known that the economic value of forests extends far beyond the timber that they produce.



*“With
13 million
hectares of forests
lost every year,
the clock is ticking
pretty fast.”*

Unfortunately, very little of that income is captured in national statistical surveys or accounts, and so it remains invisible to national policy-makers. Survey instruments used by national statistical offices need to be refined to illuminate the important contribution that forests make to the incomes of some of the world’s most poor and vulnerable communities.

Another reason for this invisibility is that much of the income is at least technically illegal — and a significant proportion is paid in bribes. When negotiations began several years ago on an agreement between the Government of Cameroon and the European Commission to ensure that timber exported to the European Union was legally sourced, it was assumed that timber produced informally for the domestic market was smaller than the formal sector share. Research conducted by CIFOR revealed that in fact this is about four times larger than previously thought, providing employment and income to some 45,000 people.

Crackdowns on illegal logging tend to target the little guys with the chainsaws rather than the

Biological diversity, non-timber forest products, sources of ecosystem services, and spiritual solace can all be found in them. And now as never before, they are appreciated for their contributions to climate change mitigation and adaptation.

Yet many of these values remain invisible to policy-makers and to the general public, especially when compared to quick profits from such alternative land-uses as commercial agriculture and mining. Forests’ hold on public and political imagination will be tenuous as long as the economic contributions of keeping them standing remain hidden or undervalued. And bringing these

contributions to light often requires changes in governance and markets. Researchers have long suspected that communities in and around forests derive much of their incomes from the direct consumption and sale of forest products. A new database representing the results of income surveys from more than 8,000 households (www.cifor.cgiar.org/pen), confirms that hunch: on average, 24 percent of their total income comes from forest products. Wood for fuel and construction, bushmeat, fruits, nuts, honey, and mushrooms for food — and a wide variety of products used for medicines, handicrafts, ornamentation, and other uses — all contribute.

“Everyone would be better off if timber produced informally for the domestic market were brought into an appropriate regulatory framework that safeguards both the environmental sustainability of the resource and the livelihoods of local producers.”

big ones with the bank accounts. Everyone would be better off if timber produced informally for the domestic market were brought into an appropriate regulatory framework that safeguards both the environmental sustainability of the resource and the livelihoods of local producers. Professionalization rather than criminalization provides an alternative way forward.

Market-based mechanisms to protect forests have a role, but have not proven sufficient by themselves to reverse deforestation and degradation. Certification schemes — such by the Forestry Stewardship Council — recognize producers who take the right values into account in their practices. But industry leaders complain that most people appear not yet ready to pay a price premium reflecting the costs of protecting those values. Purchasing decisions that reflect concerns about the sustainability of the world’s forests are driven more by the reputational sensitivities of retailers than by the preferences of ultimate consumers. More attention should be given to policy interventions to level the playing field for sustainable producers.

Logged-over “degraded” forests continue to be prime targets for conversion to other uses — despite the richness of carbon, biodiversity, and sources of local livelihood (such as bushmeat) they often contain. More informed and accountable spatial planning processes should target agricultural expansion to genuinely degraded areas, and recognize the rights of current resource users to the

benefits both of existing uses and of those that may be created by REDD and other payments for ecosystems services (PES) schemes.

The potential of using such schemes — which depend on a clear “seller” of the environmental service in question — to save the forest is compromised by the lack of clarity and conflict over who owns it . CIFOR research has illuminated the extent of such barriers to operationalizing green economy tools in conditions typical of most tropical forests. It estimates that only about half of the forests in the Brazilian Amazon that would be economically viable for PES-type payments to reduce forest-based climate emissions are not compromised by such land tenure “chaos”.

The fragility of support for protecting forests in the absence of hard evidence of their economic value is perhaps best illustrated by recent debates about how to achieve food security. These debates tend to characterize forests as a land-use option competing in a zero-sum game with agricultural expansion

— and not to highlight their important roles in contributing to food security, both in providing subsistence and cash income and in supporting sustainable agricultural productivity. Forest goods are a crucial component of rural livelihoods: 80 percent of wood harvested in Sub-Saharan Africa is for energy; bushmeat harvested from Congo Basin forests is equivalent to the production of the Brazilian beef industry. And forests’ critical ecosystem services to agriculture — as in maintaining hydrological flows and pollination services — would be impossible or expensive to replace.

Even those who understand the need to maintain forests as part of integrated landscape management strategies often focus exclusively on increasing agricultural productivity as a way of taking pressure off them. Such productivity increases are certainly necessary, and desirable for other reasons, but are not in themselves sufficient to reduce this pressure. Indeed, research has shown that, depending on relative prices and markets, increasing agricultural productivity can actually create incentives to accelerate forest clearance. So these efforts must go hand-in-hand with reform of forest governance to align incentives for forest protection.

So as we mark this International Year of Forests, governments and other policy-makers must recognize the true value that forests hold for local communities, countries and the entire world. With 13 million hectares of them lost every year, the clock is ticking pretty fast.

books

www.unep.org/publications



Integrated Assessment of Black Carbon and Tropospheric Ozone – Summary for Decision Makers

This report aims to provide science-based advice on action to reduce the impacts of the harmful air pollutants black carbon, tropospheric ozone and its precursors. The report is a comprehensive analysis of drivers of emissions, trends in concentrations, and impacts on climate, human health and ecosystems of these pollutants, which are often referred to as short-lived climate forcers as they have a short lifetime in the atmosphere relative to carbon dioxide.

2010 UNEP Annual Report

Providing an overview of UNEP's activities in 2010, this report looks at a broad range of activities carried out by the organization as it follows its mandate to provide environmental leadership and promote sustainable development. The Annual Report catalogues the beginning of a new, strategic and transformational direction for UNEP as it began implementing its Medium-term Strategy (MTS) for 2010-2013 across six areas: climate change; disasters and conflicts; ecosystem management; environmental governance; harmful substances and hazardous waste; resource efficiency, sustainable consumption and production.

Towards a GREEN Economy – Pathways to Sustainable Development and Poverty Eradication

This report aims to debunk several myths and misconceptions about the economics of “greening” the global economy, and provides timely and practical guidance to policymakers on what reforms they need to unlock the productive and employment potential of a Green Economy. The report makes a compelling economic and social case for investing 2 per cent of global GDP in greening 10 central sectors of the economy in order to shift development and unleash public and private capital flows onto a low-carbon, resource-efficient path.

UNEP Year Book 2011 – Emerging Issues in our Global Environment

The UNEP Year Book aims to strengthen the science-policy interface. It presents recent developments and new insights of particular interest to policymakers. The 2011 Year Book looks at: progress in environmental governance; the effects of continuing degradation and loss of the world's ecosystems; impacts on the atmosphere leading to continuing climate change; harmful substances and hazardous waste that affect human health and the environment; environment-related disasters and conflicts; and unsustainable use of resources.



High Mountain Glaciers and Climate Change – Challenges to Human Livelihoods and Adaptation

Compiled by UNEP in partnership with scientists and research centres from around the world, including the Norwegian Polar Institute and Norut Alta, this report underlines a clear general trend of melting glaciers linked to a warming climate. The report points to consequences such as a reduction in seasonal water availability in dry areas; faster rate of melting of many low-lying, smaller glaciers, which are often crucial water sources in drylands; an increasing rate of glacial lake outburst floods in many countries over the last 40 years.

Climate Action 2010-2011

Climate Action provides an essential platform for governments, international opinion leaders, industry experts, academics and environmentalists to debate the business case for sustainable development and carbon neutrality. Climate Action 2010-11 assists businesses and organizations to reduce their carbon footprint, highlighting that environmentally responsible operations can also be profitable. It offers insight into the pressing issues surrounding climate change and sustainability while presenting practical, potentially money saving, “actions” that can be taken to reduce carbon footprints.



Enhancing Global Competitiveness through Sustainable Environmental Stewardship

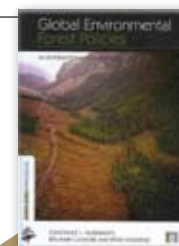
Subhash C. Jain and Ben L. Kedia (Edward Elgar)

This book examines the impact that climate change and other environmental factors have on business. It is a collection of research that suggests that companies that are proactive in mitigating their exposure to climate change risks will generate new profitable opportunities, and gain competitive advantage over their rivals in a carbon-constrained future.

Global Environmental Forest Policies – An International Comparison

Constance McDermott, Benjamin Cashore and Peter Kanowski (Earthscan)

This book provides a uniquely detailed and systematic comparison of environmental forest policies and enforcement in 20 countries worldwide, covering developed, transition and developing economies. The goal is to enhance global policy learning and promote well-informed and precisely tuned policy solutions, which it is hoped will lead to greater international accountability for forest stewardship.





Unique opportunity

Achieving reductions in carbon emissions from forests may be the raison d'être of Reducing Emissions from Deforestation and Forest Degradation (REDD+). However, as is widely agreed, it also presents an opportunity to address many of the challenges related to the underlying drivers of global tropical forest loss. It is therefore, a potentially powerful policy instrument for influencing how tropical forests are managed and valued. Yet, despite this apparent “win-win” option — or perhaps because of it — there



DR. YEMI KATERERE
Head,
UN-REDD Programme Secretariat

remains animated debate on how the REDD+ mechanism should be designed and implemented.

One explanation lies in its complexity. Every country has its

unique institutional architecture and capacity, political commitment and forest-resource endowment. All are looking at how, through REDD+, they can balance social and environmental goals, while reducing greenhouse gas emissions. Each nation's uniqueness calls for understanding the relative importance of the different drivers of deforestation and the roles that diverse stakeholders play in them. There are indeed no simple answers or solutions to such issues.

At the same time, there are mounting expectations that REDD+ can equally benefit all forests, constituencies and countries — and that these benefits could be substantial. Some believe, for example, that it offers unprecedented funding for forest and biodiversity conservation. Recent broadening of the scope of the REDD+ mechanism from the original objectives of reducing emissions from deforestation and forest degradation to include conserving and enhancing forest carbon stocks and sustainably managing forests — adding the “+” to “REDD+” — is seen as offering more countries the possibility of participating and benefiting. But reconciling all these expectations will be challenging, especially as — in some national contexts — REDD+ might not be as “low-cost” as it was once credited to be: this is particularly so where small-scale farmers may not be operating in a well-functioning market system, and may be unwilling to take the potentially huge risk of giving up their current income streams for future carbon payments that no one can yet guarantee. Add the concerns that REDD+ funding still falls short of what would be required to reduce forest-based emissions, and we are left with a mechanism that is likely to require difficult trade-offs.

Highlighting such challenges to the mechanism is both healthy and important, as it is forcing those involved in the early stages of designing and implementing it to think through the full range of related issues. Indeed, it is thanks to such openness that the overarching value of the mechanism is holding strong, backed by early lessons emerging from countries developing REDD+ strategies. To make progress, it is important that all stakeholders are prepared to abandon long established “business as usual” models.

REDD+ has brought forests back to centre stage, forcing a debate and a re-examination of issues related to Sustainable Forest Management.

It has, for example, moved faster and garnered more consensus than virtually any other mitigation option in the UN Framework Convention on Climate Change (UNFCCC) negotiations over the past two years.

The REDD+ mechanism has also mobilized significant ‘fast start’ financial resources, which are facilitating a fresh look at the challenges associated with how forests can be managed in a way that can help reduce global emissions while benefiting people and forest ecosystem services. It is effectively enabling countries to drill deeper and define the role of forests in their national economic development, the amount of forests they need to preserve, and the transformation of their economies to low carbon.

In forest-rich countries, for example, it can be the catalyst for “negotiating” a balance between keeping forests intact and promoting economic development through land concessions for large-scale rubber, palm oil and sugar plantations with significant employment, earnings and export potential. It can similarly catalyze a

critical look at the difficult trade-offs governments have to make between various policy options.

REDD+ could also provide opportunities for synergies between environmental and social benefits. It has provided a platform to many Indigenous Peoples and forest-dependent communities, enabling them to participate at the national and international levels. While initial progress may not have met expectations, this is facilitating dialogue and trust-building between them, the state and civil society organizations.

Ultimately, the issues critical to REDD+’s success are those which countries would have to deal with in achieving sustainability, whether or not the mechanism existed. Irrespective of whether a nation ever trades a single ton of carbon, it needs a national debate about where its forests fit into national economic development policies: REDD+ is proving a critical catalyst for such a debate.

The launch of the REDD+ concept in 2008 was timely and visionary. The design of the mechanism and the Cancun agreements are a measure of the level of the international community’s commitment. It therefore presents a unique opportunity to respond to the challenge of reducing carbon emissions from forests while limiting any negative impacts on both the environment and people that might result from its design and implementation.

The UN-REDD Programme is the United Nations collaborative initiative on Reducing Emissions from Deforestation and Forest Degradation (REDD+) in developing countries. The Programme was launched in 2008 and builds on the convening role and technical expertise of the Food and

Agriculture Organization of the United Nations (FAO), the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP).

The UN-REDD Programme supports nationally-led REDD+ processes and promotes the informed and meaningful involvement of all stakeholders, including Indigenous Peoples and other forest-dependent communities, in national and international REDD+ implementation.



SATINDER BINDRA

Director,
UNEP Division of Communications
and Public Information

*“The relentless
search for fuel
puts enormous pressure
on forests:
many of India’s
700 million people
collect their wood
from them.”*



Growing up in India, one of my earliest childhood memories was watching my grandmother by the smoky ‘chulha’ — the three-sided rudimentary clay stove, that still serves as the hearth in millions of rural South Asian homes. Not that I stayed there long: all the smoke and soot the inefficient stove produced ensured I never spent more than the odd minute in my grandmother’s kitchen.

This picture from my past is still today’s reality across South Asia and large tracts of the developing world. Approximately 1.6 billion people worldwide still lack access to electricity and some 3 billion still use inefficient stoves that rely on traditional biomass fuels such as firewood, crop residues and dung for cooking.

The stove’s inefficiencies occur at many levels. Their mud bodies are poor insulators, and so devour more fuel than necessary. And the volume of air cannot be controlled: too little produces thick smoke; too much cools the flames. This places a big social burden on the shoulders of women and endangers their — and their children’s — health. Again, I can still vividly recall my grandmother’s average day, much of it spent fretting over her fuel supply. She depended on cow dung that had to be painstakingly gathered, then mixed with hay and dried into small pizza-shaped patties. In a sense she was lucky: in parts of South Asia women have to collect firewood from distant jungles and are regularly at risk of being molested, hurt and injured when they leave the safety of their homes.

Women in Nepal’s hills, for example, spend almost 2.5 hours per day collecting fodder, grass and firewood. Deforestation means they have to go further afield, increasing their burden by almost 1.1 hours a day, giving them less time to devote to agriculture, raising their children or earning income.

The relentless search for fuel puts enormous pressure on forests: many of India’s 700 million people collect their wood from them. Deforestation in neighbouring Pakistan is among the highest in the world: many activists believe it was a critical factor in aggravating 2009’s devastating floods, which killed nearly 2,000 people, displaced almost 18 million and caused billions of dollars in damage.



The inefficient stoves' emissions of soot, black carbon particles, is even more devastating. The World Health Organization estimates household exposure to it causes 1.6 million premature deaths per year, predominantly in women and children. Studies in India show that women who have cooked on biomass stoves for years exhibit a higher prevalence of chronic lung disease than those who have not. Black carbon also causes or compounds pneumonia, bronchitis, cataracts, heart disease, high blood pressure and low birth weight.

And the effect of the chulhas goes beyond hearth and home. As the smoke escapes outdoors — and undergoes chemical transformations in the presence of sunlight — it forms Atmospheric Brown Clouds (ABCs) of particles and ozone gas. In Asia alone, the particles in ABCs can lead to an additional 500,000 deaths annually, while the ozone causes billions of dollars of crop damage.

Black carbon also produces between 10 to 40 per cent of global warming, as the particles warm the air like tiny heat-absorbing black sweaters. And when they settle on snow and ice they darken it, causing it to melt much faster.

But change is under way. Much more efficient stoves are being developed. A recent World Bank

study in Rwanda shows that — at a cost of just a few extra dollars — they can cut charcoal use from 0.51 kg to 0.33 kg per person per day: in a year a family could save about US\$84 in fuel costs — a substantial amount when average annual incomes in eastern and central African countries are only US\$300 to US\$370.

In India — host to this year's World Environment Day celebrations — UNEP has been involved in an exciting project called "Surya" (Sunlight), which is providing a rural area of approximately 100 square kilometres and 50,000 people with cleaner cookstoves. It will document the impact on air quality, climate, and health, using mobile phones and advanced NASA technology — and plans to use this data to try to obtain carbon credit offsets to help spread the use of the stoves.

Last September, UNEP joined the Global Alliance for Clean Cookstoves launched by US Secretary of State Hilary Clinton. The US Government has provided US\$50 million in seed money for the project, which hopes to provide 100 million clean burning stoves to villages in Africa, Asia and South America by 2020.

A study published in *The Lancet* indicates that a ten-year program

to introduce 150 million low emission stoves in India alone could prevent about two million premature deaths. And UNEP field studies show that reducing the emissions of just one ton of black carbon can slow global warming as much as cutting 250 to 3,000 tons of carbon dioxide. Unlike carbon dioxide, which stays in the atmosphere for many years, soot falls out in just a few weeks.

Improving cookstoves must now become public policy. Millions of cleaner stoves have been distributed free in India over the past 20 years through government-led campaigns but limited information on their benefits has left many unused. Institutionalizing the switch to green chulhas must become a national priority, through a public awareness campaign that highlights health safety, air quality, climate change mitigation and ultimately the creation of a Green Economy and overall economic development for rural populations in India and around the world.

My grandmother lived to the ripe old age of 97 and — while she bucked the trend by not developing any lung disease — her life around the hearth left her with a bad back. Now Indian women, the custodians of the chulha, have a chance both to improve their lives and the state of the world as a whole.

It's nature's way



RAY C. ANDERSON
.....
Founder and Chairman,
Interface, Inc.

When I speak to audiences I often ask everyone to close their eyes and picture in their mind a place of peace and repose, tranquility and creativity, the place that makes them feel the happiest — their perfect comfort zone. Then, with their eyes still closed, I ask those who are picturing somewhere outdoors to raise their hands. And then I ask them to open their eyes and look around.

What do they see? A room full of raised hands and a lot of surprised expressions. Nearly everyone thought that only they were imagining a

forest, a meadow, or a sparkling river. In fact almost everyone was doing so. In hundreds of cases, with audiences all over the world, it has always been the same.

So what does nature have to say to a company like ours — the world's largest manufacturer of commercial carpet tile — about the way we conduct our commerce and design our products? Quite a bit, as it turns out — as I explain in my book *Business Lessons from a Radical Industrialist*, where I tell the story in full.

We asked ourselves 'How does nature design its own carpets and floors?' and five years ago our design team held a workshop with Janine Benyus, the President of the Biomimicry Institute and a UNEP Champion of the Earth. She introduced the concept of biomimicry — using nature as a design mentor and a source of inspiration — challenging us to integrate nature's principles into design concepts for carpet tiles.

As a result, our lead product designer, David Oakey, sent our designers out into the forest to see what they



could learn about how nature would design a floorcovering. They were befuddled at first, thinking they were being sent out to copy flowers and leaves — but then discovered something far more interesting.

What they came back with was ‘organized chaos’. No two square yards of forest floor are the same, yet they all blend perfectly together in a harmonious whole. They realized that there is no perfect flower and there is no solid color: it’s just a diverse system — characterized by the word ‘entropy’.

They then set out to design a modular carpet the same way. In nature, each ‘module’ is slightly different in pattern and color, and that was the whole challenge. It was a challenge for the designers to let go of the aesthetics of ‘perfection’ and sameness. They also needed help from our engineers. How could you make it so that, in one production run, the color and design of every single tile would come out slightly different?

Suddenly we were bringing designers and engineers together to make it happen, something that had not been done before. The problem was solved, and thus began a new product line named — in honor of that afternoon stroll through the Georgia forest — Entropy.™

Designing carpet in nature’s way has many advantages. We can actually lay the tiles randomly instead of in a monolithic fashion. We found that it is easy to make repairs, because the tiles do not match each other exactly. It didn’t make any difference if it looked slightly different; indeed, it was better if it did!

*“No two
square yards
of forest floor
are the same,
yet they all blend
perfectly together in
a harmonious whole.”*

Off-quality practically vanished; inspectors could not find defects among the deliberate ‘imperfection’ of making no two tiles alike. And it practically eliminated installation waste. Now, every tile can find a place in a symphony of color and pattern, all different, all harmonious and pleasing, with none having to be discarded as ‘wrong.’ Different dye lots now merge indistinguishably, making it no longer necessary to keep extra tiles from each lot in case they were needed. And the user can now rotate tiles to equalize wear the way we rotate tires on our car to extend their useful life.

Similarly, while repairing traditional carpet requires calling in specially trained professionals, the random nature of Entropy’s design allows for much more flexibility. So, for instance, if a tile in a hotel room is damaged, the housekeeping staff can replace it — not worrying about which way to lay it — making the room ready again in minutes.

So how was all this received by the market? In a word, spectacularly! Entropy has become the biggest — selling product in the shortest period of time in Interface’s entire history. And that’s not only because of the many technical advantages

derived from emulating nature. It also has everything to do with that perfect place I ask my audiences to imagine.

“Nature’s designs are organic,” says David Oakey. “Natural shapes depend upon their functions. They are not linear. They are not based on lines and are therefore not limited by them. So the tiles look beautiful on a floor for the same reasons that a carpet of leaves, twigs, earth, and rocks looks beautiful on the floor of a forest.” In other words, it reproduces that perfect place we all imagine when we close our eyes and subliminally brings outdoors indoors. No wonder it sold so well!

When you build your design around a natural model, good things happen and people become excited. We sometimes say, “It’s nature’s way,” referring to the right way of doing something, and “It’s only human,” referring to making a mistake — and that’s a key difference between how we and nature do things. Nature learns from mistakes and evolves a better answer — or else. We humans can find it hard to break free of the status quo, even though it may be leading us to bankruptcy — or even killing us. How long, under nature’s rules, would an organism that refused to learn survive?

The responsibility of industrialists is to find ways to work with what we’ve been given by nature, emulating its highly effective ways to: eliminate the very concept of waste; make what we need from available, renewable resources; close the loop; and feed our production lines to make our products with renewable or recycled raw materials. In the long term — and perhaps much sooner than that — there is no other way.

UNEP at work

UNEP undertakes a wide range of activities in promoting and facilitating the development and uptake of clean technology. Here are a couple of recent examples. For further examples of UNEP's climate change work visit: www.unep.org/unite/30Ways



Planting a seed for climate protection

THE PROBLEM:

Unsustainable use of forests causes approximately 17 per cent of greenhouse gas emissions globally. In Africa, around 600 million people rely on forests and woodlands for their livelihoods. Despite the rapid growth of carbon finance transactions, projects in sub-Saharan Africa are often ignored because of a misconception that the region has limited potential.

THE SOLUTION:

The Clean Development Mechanism (CDM), established under the Kyoto Protocol, allows industrialized countries to receive carbon credits for financing carbon mitigation and sequestration projects in less-developed countries. Since 2007 UNEP's CASCADE – Carbon Finance for Agriculture, Silviculture, Conservation and Action against Deforestation – has been opening up opportunities for African participation in the CDM and voluntary carbon markets.

WHAT UNEP DID:

The CASCADE programme is implemented by UNEP and the UNEP Risoe Centre and supported by FFEM (the Fonds Français pour l'Environnement Mondial). In Benin, Cameroon, the Democratic Republic of Congo, Gabon, Madagascar, Mali and Senegal, the programme has been helping to generate carbon credits by providing technical support and training to project developers, communities and national climate change institutions. CASCADE has provided assistance to more than 20 projects in community reforestation, commercial forestry, efficient cooking stoves and fish smokehouses, and bioenergy, and has avoided deforestation in seven African countries.

THE BIG PICTURE:

The success of CASCADE's pilot projects provides a framework for the programme's expansion into other countries to further strengthen national regulatory frameworks for carbon finance projects. UNEP is planning a follow-up programme that will support a range of projects to open up opportunities for African participation in the CDM and voluntary carbon markets.



Maps for a Greener REDD+

THE PROBLEM:

REDD+ (reducing emissions from deforestation and forest degradation) is a mechanism aimed at creating a financial value for the carbon stored in forests, offering incentives for developing countries to reduce emissions from forested lands and invest in low-carbon paths to sustainable development. But there is insufficient awareness of the potential of REDD+, and countries often lack the tools to implement it.

THE SOLUTION:

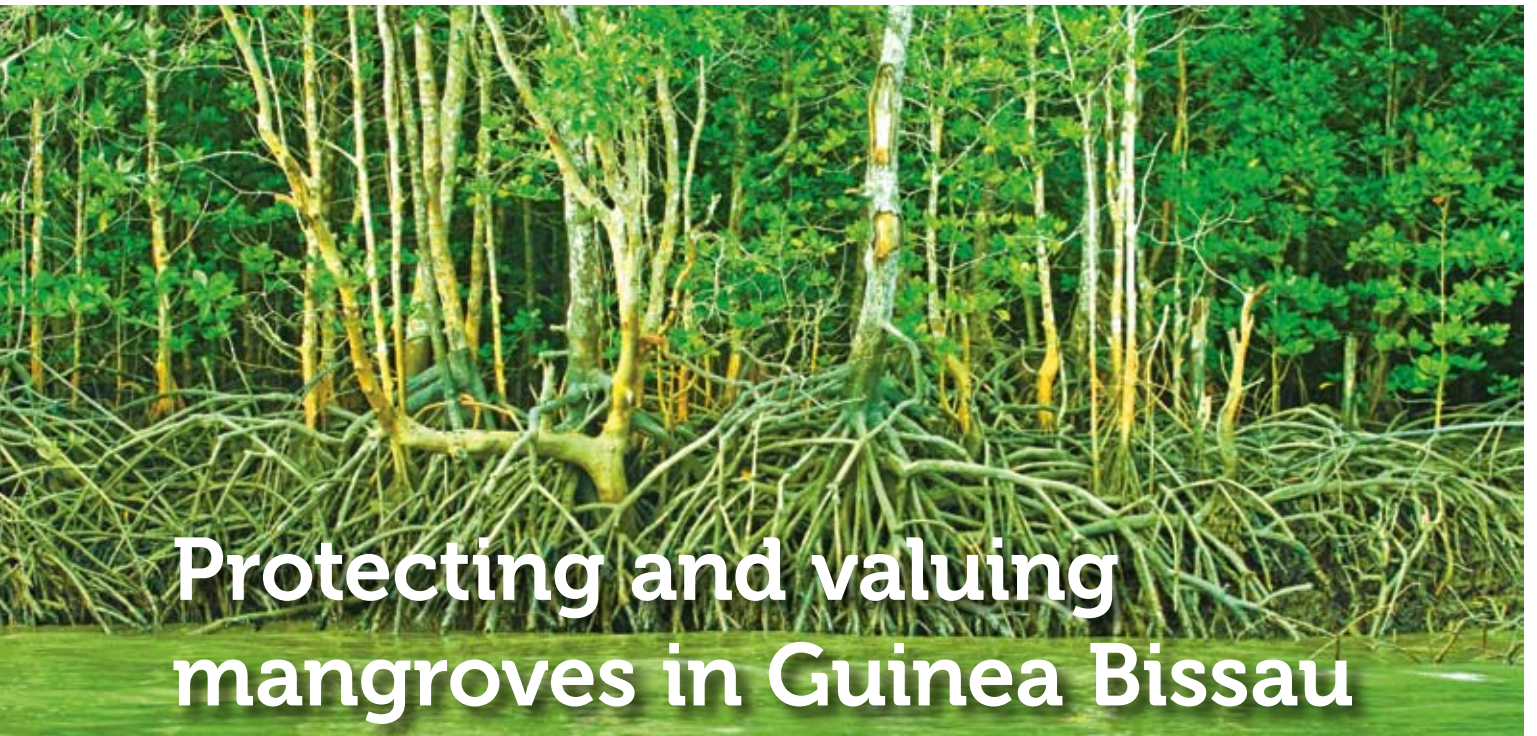
Among other things, the UN-REDD Programme helps countries recognize and tap the potential of REDD+ via technical support. One of the key tools it offers is a carbon mapping capability that shows the carbon stored in ecosystems, highlighting areas of significant biodiversity and ecosystem services' importance, and threats to forests themselves. Used together with other decision support tools, it helps countries to develop national REDD+ strategies that maximize the development potential that forests provide.

WHAT UNEP DID:

The UN-REDD Programme is a partnership between FAO, UNDP and UNEP, that helps developing countries to prepare and implement national REDD+ strategies and mechanisms. Through the programme, UNEP provides financial, technical and strategic support and works closely with geographic information system specialists in national and provincial institutions in many developing countries, to gather and collate information which provides spatial analysis tools in support of REDD+ strategy development.

THE BIG PICTURE:

At the global level, the UN-REDD Programme supports countries in their efforts to integrate multiple benefits into their REDD+ strategies and development plans. Replicable initiatives, such as the spatial analysis activities, help to ensure that forests continue to provide multiple benefits for livelihoods, conserve the planet's biodiversity, and act as important carbon stores.



Protecting and valuing mangroves in Guinea Bissau

Mangrove forests are made up of trees, shrubs, palms or ferns which have adapted to grow in salt water in the tropics and sub-tropics. At the boundary between land and sea, they are important for the livelihoods of the communities that live in their vicinity and provide valuable ecosystem services such as the protection of coastlines from storm surges and erosion; stabilization of land by sediment trapping; maintenance of water quality; sequestration of carbon dioxide; food security from subsistence and commercial fisheries; honey; building materials; traditional medicines; and revenue from tourism. These ecosystem services translate into direct economic benefits and the UNEP World Conservation Monitoring Centre (UNEP-WCMC) estimates that mangroves are worth up to US\$500,000 per km² per year.

The 2010 UNEP-WCMC World Atlas of Mangrove estimated Guinea Bissau's mangrove cover to be close to 3,000 km², the second highest cover in the region after Nigeria. The mangroves of Guinea Bissau are particularly important for biodiversity (including 180 bird species, 40 terrestrial mammal species, five marine turtle species, hippopotami, manatees, dolphins and dwarf crocodiles) and fisheries (providing revenue and food security from oysters, crabs, shrimps and finfish), with about 70% of national fish production linked to mangroves. However, they are threatened by over-exploitation as well as clearance for agriculture and urban expansion.

In order to protect these natural resources, the Government of Guinea Bissau has created a system of protected areas that covers 12% of the country. These include the mangrove-rich Parc Naturel des Mangroves

du Rio Cacheu and the Parc National des îles d'Orango. However, until now there has been low capacity to monitor the parks and enforce protection due to a lack of staff and equipment to stop illegal poaching and logging in the protected areas.

UNEP, through the Spanish Lifeweb project, is working with the International Union for Conservation of Nature (IUCN) to improve the management of the parks. This includes training and outreach work with government rangers and local fishing communities who will participate in park management.

UNEP has already supported IUCN to purchase three motorboats as well as GPS and radio equipment which are indispensable for enforcement of park regulations. Satellite data-sets showing historical as well as current mangrove coverage and rates of deforestation have also been provided to local governments and NGOs. By protecting the mangroves against deforestation and over-exploitation, important biodiversity and fisheries resources will be conserved for the future well-being of local populations.

Alongside the efforts to bolster monitoring and enforcement, UNEP is also working to economically value the mangrove resources of Guinea Bissau and the ecosystem services they provide. This will provide the economic evidence and rationale for policy-makers and local communities to protect these important forests. By measuring carbon storage in mangrove forests it could be possible to develop mangrove projects for REDD+ and thus access international carbon funding for mangrove conservation in Guinea Bissau.

Gabriel Grimsditch

products



Underwater kite

"Deep Green" behaves just like a kite, only it flies not in the wind but tidal currents. Attached to the ocean floor by a long tether, it glides from side to side. The water flowing past it spins a turbine under its "wing" and generates electricity. Among the advantages it has over other tidal power concepts is increased power from a smaller package, and a capacity to harness power from slow moving waters. It's still a prototype but it's estimated that a Deep Green system mounted along UK shores could generate enough green electricity for approximately 4 million UK households every year.

www.minesto.com/

Wind-powered car crosses Australia

The Wind Explorer is the first electric vehicle to cross a continent powered by the wind. The light-weight vehicle crossed Australia, from the Indian Ocean to the Pacific Ocean—4,800 kilometres—in 18 days. Piloted by German extreme sportsmen Dirk Gion and Stefan Simmerer, the 200 kg car set three new records: the first time a continent had been crossed by a vehicle powered by wind, the longest overall distance covered by an exclusively wind-powered land vehicle, and the longest distance covered in 36 hours. The Wind Explorer was powered by lithium-ion batteries, recharged by a portable wind turbine whenever wind conditions permitted.

www.wind-explorer.com



Fully recyclable laptop

Roughly 2 million tons of electronics became obsolete in the US in 2005, but less than 380,000 tons of electronics were recycled. Hence, the motivation behind the Bloom Laptop was to reduce the amount of e-waste going to landfill. The Bloom laptop is fully recyclable in two minutes, via 10 easy steps — no screwdriver required. All the components can be separated easily from the frame for proper recycling. It's the brainchild of a group of mechanical engineering students at Stanford University, USA, and Finland's Aalto University. Their project won the students an inventor of the month award from design software giant Autodesk.

<http://inhabitat.com>



Tue blue gowns are truly green

The blue graduation gown of the University of North Carolina has gone green. With the encouragement of eco-conscious students who prefer a gown that might only be worn once in a lifetime to be made from recycled materials, award-winning fashion designer Alexander Julian, an alumnus of the University, worked with manufacturers Oak Hall Cap & Gown, to create the first designer graduation gown. In addition to adopting the perfect "Californian blue", the garment is made from 100 per cent post-consumer recycled plastic bottles. Twenty-three plastic bottles are used to make each gown. The label is printed directly onto the garment rather than a separate label.

<http://uncnews.unc.edu/content/view/4310/75/>



Greenest container ships ever built

Shipping company Maersk has announced that it will be buying ten of the world's largest, most efficient container ships ever built. Curiously, the ships will be both the largest and greenest shipping vessels ever to set sail. They are more environmentally friendly due to the economy of scale — they carry more cargo, so the emissions per container are less. These huge ships produce 50 per cent less CO₂ than the industry standard for Asia-Europe trips and consume 35 per cent less fuel per container. The ships will be 400 m long, 59 m wide, 73 m tall, and carry 16 per cent more than the current standard.

<http://inhabitat.com/>

Surfboards Made From Ocean Trash

Surfer Kevin Cunningham has come up with one of the coolest ways to recycle ocean pollution. Sick of all the debris on his local beaches, he decided to make surfboards out of it. Fragments of human-made debris such as plastic and glass are recycled and reused in the skin of the surfboard, plastic bags are woven into a strengthening cloth; plastic bottles are cut up and reassembled into fins; and there are many other possibilities to be explored, says Cunningham. His company Spirare Surfboards is producing a limited series of boards made from reclaimed debris for public exhibition, to be followed by a line of 100 boards that will be sold as custom orders.

<http://spiraresurfboards.com/>





© Peter McArthur/Corbis

Forests produce green growth



YOLANDA KAKABADSE
.....
President,
WWF International

“What will the Green Economy look like?” is a hot topic among bean counters and tree huggers alike.

There is a growing awareness that the prevailing economic model isn't delivering. It's not delivering for the roughly 3 billion people worldwide who live on the equivalent of US\$2 a day or less. It's not delivering for species: WWF's Living Planet Index shows a decrease in biodiversity by 30 per cent since 1970. And it is not working for forests, which are being lost at a rate of some 13 million hectares a year.

So, if it isn't working for all these people, animals and natural resources, how much longer will it continue to work for the lucky and relatively few whose lifestyles are the least sustainable?

The answer is: not long at all. WWF's Living Planet Report shows that wealthy nations continue to depend on resources from other countries, contributing to an alarming rate of biodiversity loss in low-income ones. Indeed, the poorest and most vulnerable nations are subsidizing wealthy lifestyles. In all, humanity is using the resources of 1.5 planets. You don't have to be an economist to know that such an overdraft will come painfully due.

That's why the concept of a Green Economy is so exciting. Finally, CEOs and heads of state, conservationists and community leaders are laying the foundation for a system that creates well-being, not just wealth.

Forests are crucial because their products and ecosystem services touch all sectors of the economy. Their perilous state can be correlated to the flaws in our current economic model: poor governance, corporate greed, disenfranchisement of the poor. A Green Economic model would correct these through new incentives and new measures of progress.

Indonesia provides an interesting example of how these shifts might play out. It has made public commitments to 7 per cent GDP growth and up to 41 per cent (with international support) carbon emission reductions by 2020. This ambitious “7-41” aspiration can only be achieved through responsible management of forests and sustainable land-use planning. With more than half of Indonesian emissions coming from deforestation and forest degradation — and 15 per cent of GDP from forestry and agriculture — realigning the forest system is essential.



*“We still have
good forests
because people know their
lives depend on them.
When we want to eat,
we come to the river
or to the forest.”*

(Just as a responsible person doesn't become a thief just because the shop owner isn't looking, responsible businesses don't take advantage of poor governance to turn a profit.) In the long term, such public/private-sector groups lead to better policies that apply to all companies.

Traditional conservation values — the product of generations of reliance on the bounty of forests, rivers and seas — can be recognized and properly rewarded in Indonesia. REDD+, with strong social safeguards, could be a significant step forward in preventing runaway climate change and reducing the burden of poverty.

Even as we work to scale up REDD+, there are sparks of progress that demonstrate how indigenous communities can reap the rewards of their environmental stewardship in a new, Green Economy. Take Long Pahangai in Borneo's East Kalimantan. Its Dayak people live much as their ancestors did, with close ties to the land. “We still have good forests because people know their lives depend on them. When we want to eat, we come to the river or to the forest,” says Iskander Idris, Secretary of the village.

And Long Pahangai's conservation may have other benefits. The intact

forests have protected the whole watershed, including a tributary that flows near the village on its way to the Mahakam River, which will generate hydropower to bring electricity to the village. Establishing such micro-hydro is one way WWF and partners are trying to make conservation pay dividends for rural communities. 1.4 billion people globally have no access to reliable electricity and this affects their health, education, earning potential and ability to participate fully in society.

“This project is a partnership between the provincial government, the local government, the community and WWF,” says Data Kusuma, WWF's project leader. “Originally, the provincial government proposed installing the micro-hydro turbine in another community. But WWF showed them that the forest was too degraded — the river had become silted and didn't even run all year. That community would be very disappointed to have a system that didn't work properly.

“In Long Pahangai, the river can support the micro-hydro turbine and this can be a model for other communities; if they rehabilitate and reforest their catchment areas, micro-hydro could work for them, too.”

Tigang Himang, the Head of the sub-district, adds, “The villages in this sub-district depend on nature and live in harmony with their environment. But we need economic development, too. Here, everything is done by human power. With electricity, we can be more productive and benefit from technology.”

We might yet not have definitive understanding of what makes a “Green Economy”, but that must be a good start.

We are squandering forests. It's easier to cut into pristine natural forest than it is to untangle the red tape around already deforested land. But resolving tenure and land-use rights for this degraded land — of which there are an estimated 30 million hectares in Indonesia — would significantly enhance the prospect of developing it for new oil palm and timber plantations. Such policy reforms — alongside incentives created by a market that is increasingly discerning about the carbon footprint of products and willing to reward emission reduction — will create an environmental and economic win-win.

For their part, many businesses have already realized that their bottom line depends on healthy forests, and have endorsed voluntary standards like the Forest Stewardship Council and Roundtable on Sustainable Palm Oil. In the short term, these standards can mitigate the losses caused by poor forest management.

people



CHAMPIONS
OF THE EARTH

Climate champion Mexico's **PRESIDENT CALDERON** has made clear his ambition to make Mexico a world leader on climate action during the last meeting in Cancun and has been active in promoting the Green Economy, particularly in his work with forests.



Russian scientist **DR. OLGA SPERANSKAYA** has been garnering headlines worldwide for her work to reduce the harmful impact of toxic chemicals in Eastern Europe, the Caucasus and Central Asia and was the winner of the prestigious Goldman Prize in 2009 for her work in identifying and eliminating the Soviet legacy of toxic chemicals in the environment.



ANGÉLIQUE KIDJO, from Benin has a voice loved by thousands of fans around the world. The singer-songwriter is also a powerful voice for humanitarian and environmental change. Described by Time Magazine as “Africa’s Premier Diva”, Kidjo uses her celebrity status to speak out in support of a number of important causes, particularly girls’ education and sustainable development.



ZHANG YUE – Chairman and Founder. “Responsibility is more important than growth”, runs one of the company mottos of China’s BROAD Group. With a degree in fine arts, Zhang Yue has put his creative powers to work and is now focusing on sustainable buildings worldwide with energy efficiency five times that of conventional buildings.



LOUIS PALMER of Switzerland provides a green twist on Jules Verne’s famous voyage. The adventurer successfully led a fleet of electric vehicles around the world last year. The “Zero Race” teams crossed the globe in eighty days, highlighting two of the major environmental challenges facing the world today – the need for more sustainable transport and cleaner energy supplies.



MARYANNE GRIEG-GRAN

Principal Economist,
International Institute for Environment
and Development



STEVE BASS

Head, Sustainable Markets Group,
International Institute for Environment
and Development

Economies grow on trees

Many countries are beginning completely to rethink their economic strategies, as they struggle with tackling recession and reducing high levels of public debt. The Green Economy offers them a means to grow out of recession in ways that are resource-efficient, ecologically-sound and equitable — and so produce genuine wellbeing. Forests can play an important part in the Green Economy, providing attention shifts beyond wood and fibre production alone to the full range of the ecosystem services they provide.

Economic statistics for forests tend only to track wood and fibre-based products. These account for 1 per

cent of global GDP and 0.4 per cent of formal employment, but make a bigger contribution in some African countries — up to 13 per cent of GDP. Important as this is, forests contribute much more. Over 2 billion people depend on wood for cooking, heating and preserving food. Hundreds of millions (estimates vary from 119 million to 1.4 billion) depend on forests for employment and livelihoods. More hidden still are the public goods derived from forest ecosystems: forests sustain over 50% of the world's terrestrial species; they regulate global climate through carbon storage and protecting watersheds; and they have great cultural significance.

Forests are a renewable resource — their products are also recyclable and biodegradable — and there have been notable advances in processing efficiency, including through using wood residues and recycling wood and paper products. As a result, an expected doubling of global demand for wood and fibre by 2030 can be met with only a 40 per cent growth in timber harvesting. And much of this increase in demand will be met from planted forests, which have also shown marked increases in productivity.

With such advances in resource efficiency, the forest sector could seem a perfect example of the Green Economy in action. However,

shaping a Green Economy also entails stopping bad practice. Much timber harvesting is conducted on a non-renewable basis, often because of pressure from cash crops and cattle ranching, which offer higher returns. Deforestation, mostly in the tropics, is currently 13 million hectares per year, which the Food and Agriculture Organisation considers alarmingly high. Large areas of forest are being degraded through poor harvesting practices and illegal logging is widespread. So valuable ecosystem services and economic opportunities are being lost. These services are currently unpriced, and thus largely ignored, in management decisions — except in the islands of innovation represented by payments for environmental services (PES) schemes.

Yet the last decade has also brought good news. It is increasingly recognized that investing in reducing deforestation as a climate change mitigation option makes economic sense: the climate regulation benefits of halving deforestation have been estimated to be worth three times the costs. This is helping to push a forest-based approach to mitigation up the agenda in international climate negotiations, first as REDD (reducing emissions from deforestation and degradation) and more recently as REDD+ (which adds conservation, sustainable management of forests and enhancement of carbon stocks to the list of eligible activities).

This is all leading to greater recognition that investments in forests are more attractive if they capture the full range of forest ecosystem services, not just wood and fibre. This means more investment in: protecting forests, principally by ensuring a greater share of the benefits for local communities; improving management of production forests to minimise damage to ecosystem services; and increasing the area of the kinds of planted

forests that support many ecosystem services. From certified timber production and markets for ecosystem services, to partnerships that reward local poor people for conserving forests, we already have enough examples that work of Green Economy forestry to warrant more serious policy attention. Such 'glimpses of the future' need to be assessed for the ecosystem services they offer and their distribution of costs, benefits and risks, and promoted more widely in the REDD+ negotiations.

“Decision-makers and the wider public would better appreciate the many roles of forests — as ‘factories’ (producing goods from wood to food), as ecological ‘infrastructure’ (regulating climate and water regimes), and as providers of innovation and insurance services (through the resilience provided by forest biodiversity).”

Economic modelling for UNEP’s Green Economy report indicates that green investments in forests can boost national economies, while protecting ecosystem services. Providing just 0.035 per cent of global GDP each year between 2010 and 2050 in public investment to pay forest landholders to conserve forests, plus private investment in reforestation, could raise value added in the forest sector by 20% and increase the amount of carbon stored by 28%.

A global deal on REDD+ may be the best opportunity to conserve forests and invest in their contribution to a Green Economy. Existing PES schemes have been limited by a

lack of funds to scale up from pilot projects. But if a deal can be struck, there could be a step change in the funds available. A global REDD+ agreement could tip the finance and governance balance in favour of long-term sustainable forest management. It would also open up the prospect of new types of forest-related jobs, livelihoods and revenues where local people can be rewarded as guardians of forests and ecosystem services. Safeguards will be needed to protect the rights of forest-dependent people — particularly when these derive from traditional systems rather than formal legal ones — and to ensure that those who bear the opportunity costs of REDD+ schemes receive an appropriate share of the benefits.

A vision for a forest sector in a Green Economy is now in sight. Decision-makers and the wider public would better appreciate the many roles of forests — as ‘factories’ (producing goods from wood to food), as ecological ‘infrastructure’ (regulating climate and water regimes), and as providers of innovation and insurance services (through the resilience provided by forest biodiversity). The economic reach of forests would extend to sectors beyond wood and paper industries alone, lightening their ecological footprints by substituting renewable forest fibre for non-renewable metals, concrete and plastics, and carbon-neutral woodfuels for fossil fuels. Effective local control and management of forests would be encouraged by greater financial incentives, sustained by a robust and fair international regime to pay for forest global public goods. Such payments would also support and reward partnerships with local and community stakeholders who depend closely on forest health. With such incentives to produce multiple benefits, forest stakeholders will routinely value the range of forest goods and services, and account for them better.



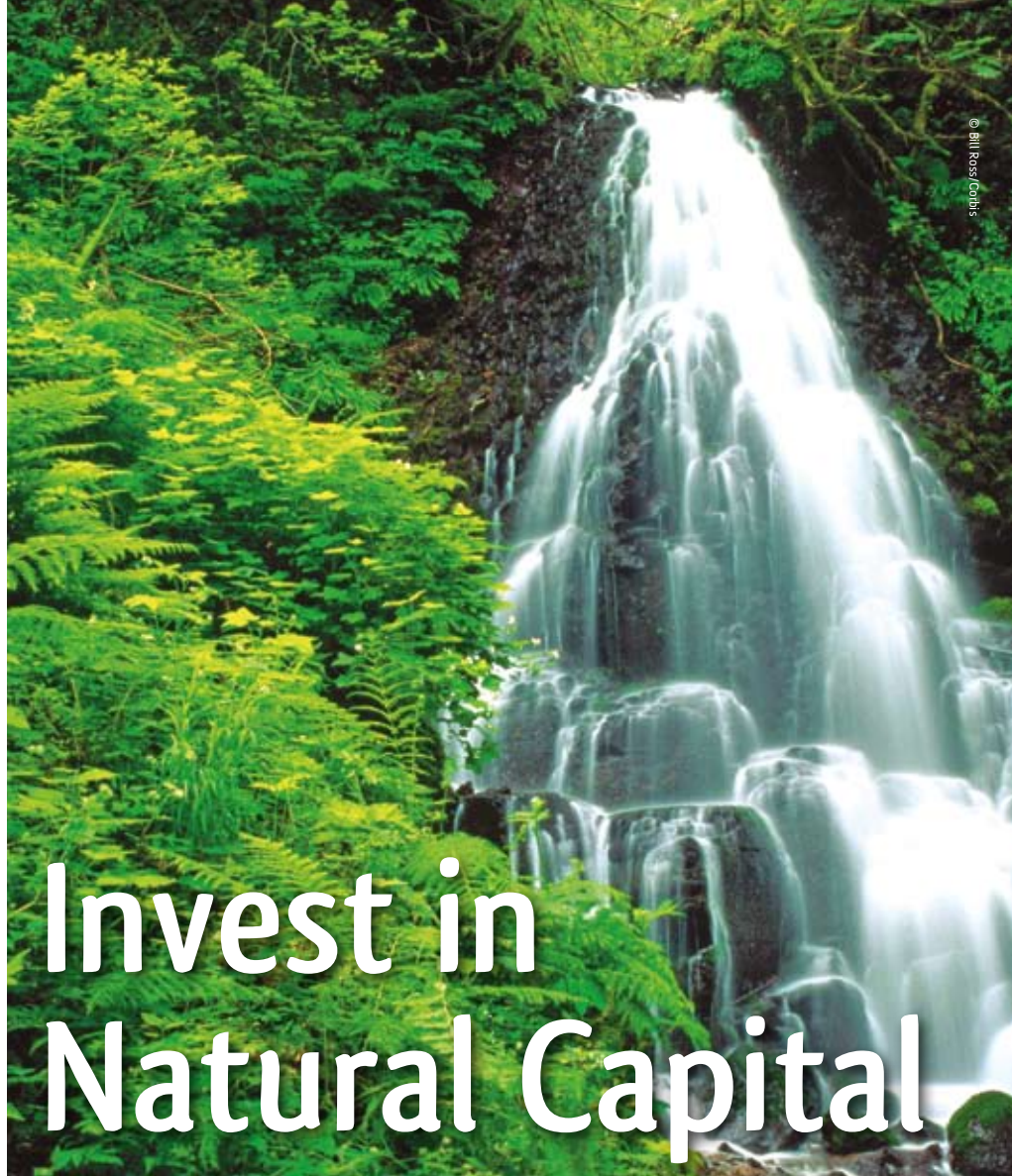
ANDREW W. MITCHELL

.....
Founder and Director,
Global Canopy Programme,
Chairman, Forest Footprint Disclosure Project

The English playwright, Oscar Wilde, once commented that the cynic knows the price of everything but the value of nothing. Today many claim that biodiversity is 'priceless', but few seem prepared to pay for it. The value of its existence alone has not been able to stem a 20th century tsunami of economic forces that regards destruction of biodiversity as the acceptable collateral damage of prosperity. And, too often, rising population has left the poor with little option but to plunder biodiversity for survival.

A very different view of conservation is needed if the Millennium Development Goal of immediately reducing biodiversity loss is to have any hope of being achieved this century. At the leading edge of the debate - biodiversity itself should be replaced by the ecosystem services it provides to humanity. Forests offer a proxy through which to explore how natural capital underpins everyone's climate, water, food, energy, health and livelihood security.

The unknown world of the tropical rainforest canopy fascinated me as a young zoologist in Borneo. Reaching the treetops - where the tallest Dipterocarp soars over 90 metres - was a dangerous operation involving catapults and climbing ropes from below or hot air balloons from above: so I constructed precarious aerial walkways to enable scientific teams to explore at ease. What we discovered stunned us, revealing the breathtaking extent of our ignorance.



© Bill Ross/Corbis

Invest in Natural Capital

Perhaps half of all life on earth lives up there, never coming down to the ground. Some 80% of the insects that entomologists discovered in the canopy in Asia had no name, about 60% in Central America were still new to science.

Thirty years on, much more - of possibly greater significance - is understood. Atmospheric scientists and eco-physiologists at the Brazilian and NASA-funded Largescale Biosphere Atmosphere experiment built towers across Amazonia's forests and measured the fluxes of gasses like carbon and oxygen in and out of the forest canopy. This revealed that such forests remove about a tonne of carbon per hectare each year from the atmosphere, storing it in trunks

and roots. Furthermore, trees release vast quantities of a rich mix of volatile organic compounds into the air - where the chemicals oxidise in sunlight to create tiny nuclei around which water droplets form. In effect, the Amazon canopy seeds its own rain. Thus biodiversity provides immense regulating services to our atmosphere.

Imagine the world's tropical forests as giant 'eco-utilities', like a power station or water treatment plant, providing ecosystem services we all use, but no one yet pays for. They are the largest existing terrestrial carbon capture and storage (CCS) system, scrubbing the atmosphere of a billion tonnes of pollutants each year. They do it for free, while industrial CCS may cost US\$300



per tonne or more to do the same job. Clearing and burning tropical forests both removes this unique system and emits smoke equivalent to the annual carbon emissions of all transport worldwide. Payment for halting the loss of forests is the inspiration for REDD, the proposed UNFCCC mechanism to reduce emissions from deforestation and degradation, and could generate billions of dollars for poor forest-owning nations. The glacial pace of UN negotiations has admittedly bred cynicism in carbon markets, but Norway has provided \$2.5 billion to set the pace for implementing what promises to be the largest, cheapest and quickest means of combating climate change this decade.

Forests also provide another, possibly even more valuable ecosystem service. According to the Intergovernmental Panel on Climate Change, Amazonia's tree crowns release eight trillion tonnes of water vapour a year. This is recycled many times by the forest canopy water pump before reaching the Andes. Some of it falls as snow, to feed melt water into the vast river basins of the Western Amazon and scientists speculate that a low level jet stream transports

moisture to fall as rain on the beef and soy ranches of southern Brazil, and possibly on the economic breadbasket of the La Plata Basin.

What would happen if this pump should ever become unreliable? Would the lights go out in São Paulo as giant hydro dams ran dry, or would food prices in Europe rise as Amazon soy failed to arrive to feed its chickens, pigs and cows? Severe droughts are increasing in the Amazon, and those in 2005 and 2010 provided a foretaste of what could happen. Rivers dried up, grounded soy barges had to make a 2,000-kms deviation to reach markets, fish gasped on river banks as remote villages starved, hospital admissions rose and airports closed due to smoke from forest fires.

UNEP's landmark report *The Economics of Ecosystems & Biodiversity* estimated the ecosystem services lost by deforestation as worth between US\$1.4 – 4.5 trillion a

year. Investors are waking up to the fact that some companies are running increasing risks by failing to account for their use of natural capital, and its ecosystem services, in their business models. The Forest Footprint Disclosure Project calls on companies to disclose their use of commodities – such as beef and leather, soy, palm oil, paper or pulp – that drive deforestation: in just two years, 57 major investing institutions managing US\$ 5.7 trillion in assets have endorsed it. On the upside, a UNDP report: *Latin America and the Caribbean — A Biodiversity Superpower* shows that the region has a major economic opportunity in trading in ecosystem services,

Proactive Investment in Natural Capital (PINC), as outlined in the Global Canopy Programme's *Little Biodiversity Finance Book*, offers a new economic vision for nature. Whilst REDD is inexorably linked to emerging markets for carbon, the PINC framework offers 17

“Valuing natural capital and paying for its maintenance, depletion, or restoration should become as commonplace as using financial or social capital.”

mechanisms that could pay for biodiversity and its ecosystem services, reaching US\$140 billion annually in 2020. Many are available now. Valuing natural capital and paying for its maintenance, depletion, or restoration should become as commonplace as using financial or social

capital. Safeguards and equitable benefit sharing in this process are fraught with difficulties, but the risk from business as usual is greater. Tropical forest nations and their peoples are rich in natural capital, and they need to be adequately rewarded for maintaining ecosystem services. If a way can be found to do this, one day their forests really will be worth more alive, economically, than dead.

awards and events

CLEAN UP THE WORLD



Clean Up the World is a community-based environment campaign held in partnership with UNEP. Clean Up the World inspires and empowers individuals and communities from every corner of the globe to clean up, fix up and conserve their environment. The tag line for 2011 is "Our Place... Our Planet... Our Responsibility", in keeping with the World Environment Day theme. To find out how you can help with Clean Up the World Weekend, 16-18 September, and learn more, visit www.cleanuptheworld.org and find us on:



UNEP YOUNG ENVIRONMENTAL JOURNALIST AWARD

Ugandan radio journalist, Patricia Okoed-Bukumunhe, won the prestigious new UNEP Young Environmental Journalist Award. Okoed-Bukumunhe won for her report Climate Change and Uganda, broadcast on Radio France International. Jury members described the entry as "original, cutting edge environmental reporting".

Launched in November 2010, the UNEP Young Environmental Journalist Award aims to showcase excellence in the field of environmental reporting and to nurture new talent that will help to shape opinion on the environment in Africa, and beyond, in years to come.

www.unep.org/yeja/



UNEP SASAKAWA PRIZE



Two exciting projects took joint honours in the 2011 Sasakawa Prize for grassroots sustainable development initiatives. Both projects won for their work in conserving forests and promoting sustainable development in remote rural communities of Latin America and Asia. The Asociación Forestal Integral San Andrés, Petén (AFISAP) in Guatemala and the Manahari Development Institute in Nepal (MDI-Nepal) are the co-winners of this year's award around the theme "Forests for People, Forests for Green Growth" in support of the 2011 International Year of the Forests. The winners were announced in February and each received a cash prize of US\$100,000 to expand their groundbreaking initiatives.

www.unep.org/sasakawa/

WORLD ENVIRONMENT DAY



World Environment Day (WED) takes place on 5 June. WED is a global day for positive environmental action and one of the United Nations key initiatives to stimulate worldwide awareness of the environment and encourages political attention and action. WED 2011 is expected to

be the biggest ever and communities the world over are encouraged take action to care for their local environment. This year's global host for WED is India, and the theme is "Forests: Nature at Your Service" in keeping with the 2011 International Year of Forests.

www.unep.org/wed

SEED AWARDS 2010



Grassroots environmental projects in Burkina Faso, China, Colombia, Ghana, Kenya, Rwanda, Senegal, South Africa and Sri Lanka are winners of the 2010 SEED Gold Awards. The 2010 SEED Awards were presented in February this year by the SEED Initiative, whose mission is supporting entrepreneurs for sustainable development. The prize recognizes promising, locally-driven start-up enterprises that work in developing countries to improve livelihoods, tackle poverty and manage natural resources sustainably. The winners will receive individually tailored business and partnership support services, worth US\$35,000 to help them become established and increase their impact.

www.seedinit.org

GREEN AWARDS FOR CREATIVITY AND SUSTAINABILITY

The Green Awards highlight the best examples of green marketing and sustainability communications that have made a real difference in the fight against global warming. The Green Awards recognize excellence in 16 categories from Best Green International Campaign, for global entrants, to Best Green Campaigner, for individuals and small groups championing sustainability. The overall 2010 winner was the China Environmental Protection Foundation, by virtue of an innovative and effective outdoor campaign created by DDB China, urging people to walk more and drive less.

www.greenawards.co.uk/home



Visit them, conserve them

© Paul South/Stock Images



© Federico Lofre



TENSIE WHELAN

President, Rainforest Alliance

No fewer than 1.6 billion people — nearly a quarter of the world's population — depend on forests for their livelihoods. Forests are also critical to maintaining biodiversity, mitigating climate change and enabling key ecosystem functions that regulate the biosphere. And, as the UN resolution declaring 2011 the International Year of Forests recognized, managing forests sustainably can contribute significantly to sustainable development, poverty eradication and meeting the Millennium Development Goals. And yet about 45 per cent of the world's forests have already been cleared.



© Huoroni Ecolodge

Building a sustainable tourism economy around visiting forests is a powerful way of witnessing and leveraging their contributions. If that sounds a little trivial compared to the planetary stakes of conserving the world's remaining forests then consider these economic facts.

The global timber trade is worth over US\$150 billion a year. That money often creates short-term, perverse incentives — especially in developing nations — to fell forests even though in the long run countries are far stronger economically when they manage them sustainably.

The value of forests is far higher than the value of the timber trade. The total value of the ecosystem services they provide — such as carbon capture, water filtration, soil fertility and pest management — is estimated at US\$4.7 trillion annually. Forests contain over half of the planet's biodiversity, on which around 40% of the world's economy — particularly agriculture, forestry and pharmaceuticals — directly depends. The value of forests, like the value of survival, can't be measured in money: but if we compare them to human economic activity, they couldn't be "worth" less than 20% of Gross World Product, or at least US\$15 trillion — two orders of magnitude higher than their timber.

Now consider the value of travel and tourism, one of the world's largest and fastest growing industries. It generates about US\$6 trillion worldwide — over 9% of Gross World Product — and employs 235 million people. It is especially important for the economies of developing countries, which house most of the world's most biodiverse forests. From 1990 to 2006, international tourism revenues in developing countries quintupled, from US\$43 billion to US\$222 billion. Travel and tourism globally has continued to grow robustly through the economic

downturn: by 2021, it is forecast to generate over 13% of GWP or US\$9.2 trillion, employing one in ten of the world's workers.

Ecotourism is estimated to be growing three times faster among leisure travelers than the overall industry: it of course encompasses forest-based tourism — including travel to lodges that own protected areas or to forest-based communities that run tourism

operations, situated near or within national parks and biosphere reserves. Though a fraction of the total market, the potential economic value of forests as tourist destinations could clearly exceed their market value as timber stocks, and would be exploited much less destructively and more profitably. The power of tourism can generate massive investments in conservation that carry a high rate of return. Tourism market values are much more commensurate with a broader view of what forests are "worth" (many trillions of dollars). Tapping those values can preserve forests' biodiversity, ecosystems services and other invaluable assets. USAID's Forestry Team found that nature-based tourism contributes to forest protection "through heightened awareness of biological resources and the generation of alternative income-producing opportunities."

"The value of forests, like the value of survival, can't be measured in money: but if we compare them to human economic activity, they couldn't be "worth" less than 20% of Gross World Product, or at least US\$15 trillion – two orders of magnitude higher than their timber."

Of course, large-scale tourism can also decimate ecosystems, from coral reefs to rainforests: so it's critically important that it, like forestry, is managed sustainably. Forest Stewardship Council (FSC) certification has a huge, positive impact on forest management. So far 334 million acres of forestland — about 1% of the Earth's land area, roughly twice the size Texas — are under FSC responsible management (just under half of those acres are certified by the Rainforest Alliance). FSC is growing rapidly, and its sustainable practices are deeply and rapidly influencing industry practice — including selective harvesting of lower volumes of wood, replanting, providing wide conservation areas, preserving sensitive ecosystems, protecting the habitat of endangered species and maintaining carbon sequestration to reduce carbon emissions. It is the gold standard for environmentally and socially responsible forestry, helping communities earn a living by maintaining healthy, productive forests.

Given the value of the tourism sector, and the rapid growth of ecotourism, an analogous system for sustainable tourism could be a powerful tool in providing communities with an additional way to make a good living by keeping their forests standing. Tourism is relatively labor-intensive and can help reduce poverty and increase economic equality

for women, who make up 46% of the tourism workforce, higher than the global average. Tourism jobs offer relatively high wages and have a job-creating multiplier effect. A new study by the Center for Responsible Travel, for example, found that workers in ecolodges in Costa Rica's Osa Peninsula — which National Geographic calls “the most biologically intense” place on earth, but is also one the country’s poorest regions, — earn twice as much (\$710 a month) as workers in a range of other fields. In Nicaragua, where tourism focuses prominently on the natural environment, the Rainforest Alliance estimates that every job in tourism creates an additional local job in another sector, with a higher wage than the national average.

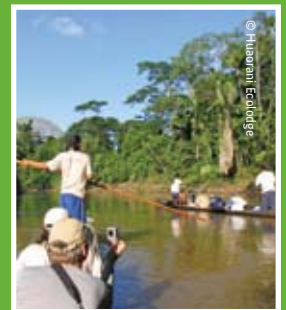
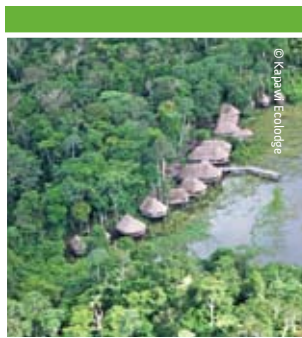
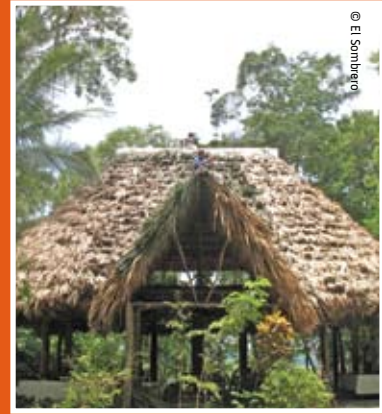
For all these reasons, Rainforest Alliance promotes sustainable tourism along with sustainable forestry and agriculture. It helps tourist businesses get up to speed by providing them with training and technical assistance, and verifies compliance with sustainability requirements, so they can achieve sound accredited certifications. We supported the launch of the Global Sustainable Tourism Council (GSTC), which advances universal principles and criteria, connecting diverse businesses, governments, UN bodies, research and academic institutions, social and environmental NGOs and certification programs around the world. And we launched the website SustainableTrip.org, aggregating businesses that are verified by independent, third-party sustainable tourism certification programs on a searchable database where travellers can find sustainable forest destinations.

Sustainable tourism certification is still in its relatively early days, but it has already demonstrated a potential to tap the power of market forces and the need for sustainable development to create powerful incentives for conserving forests.



The Explorer’s Inn has preserved a forest setting along the Tambopata River in Peru that contains a record biodiversity of birds and butterflies.

In Guatemala, the Ecolodge El Sombrero in Peten region supports local communities and initiatives for conserving the Yaxha-Nakum-Naranjo National Park, while the Tak’alik Maya Lodge is preserving its surrounding Subtropical Very Humid Forest, home to 29 known species of amphibians and reptiles, nine mountain springs, rodents, bats, carnivores and ungulates, otter, paca, coati and ocelot. The Pacuare Lodge on the Pacuare River, is deep inside a 25,000 sq km primordial forest which contains jaguars, ocelots, monkeys, sloths, and numerous other species of mammals and birds.




In Ecuador, the Kapawi Ecolodge and Huaorani Ecolodge are in remote and well-protected parts of the Amazon, deep in the large First Nation territories of the Achuar and Huaorani people, respectively. Both peoples have chosen tourism as an alternative and effective way of conserving their land and heritage, and — in the case of the Huaorani — to keep their land from exploitation for oil.



"We need to start from every small change in our lives."

LEBBING



“If you eat up forests today, the deserts will eat you up tomorrow.” Top Chinese actress Li Bingbing recalls this phrase when asked about the importance of forests. “It’s quite simple, but to the point,” she says. And she has backed up her words with action.

Last year the award winning actress – a UNEP Goodwill Ambassador – created her own charity, Love Green, “to promote green ecosystems, the Green Economy, and green life”. Its first project – which she launched with former British Premier, Tony Blair, and has been carried out in collaboration with the Climate Group – was to plant trees to combat desertification in northwestern China.

It is succeeding beyond expectations. “It took only nine months, instead of the planned two years, to plant the first million trees,” she tells Our Planet.

She has been an environmentalist from an early age. “As a young girl, I would make a point of switching off the air conditioner when we left the house. As a teenager, I opted to walk or use public transport wherever possible and, ever since, I have separated my trash for recycling. I believe that if we all take our responsibilities towards the Earth seriously, and make caring for the planet part of our daily routine, we could make great strides towards preserving it for future generations. We need to start from every small change in our lives.”

Born in Heilongjiang province, in the far northwestern China, in February 1973, Li Bingbing originally had no intention of becoming an actress, and instead enrolled in a school for prospective schoolteachers. But, after graduating, she became dissatisfied with that career, and was eventually persuaded by a friend to join the Shanghai Drama Institute in 1993. She won the first of many “best actress” awards at the 1999 Singapore Film Festival for her film debut, later winning similar titles in the 2005 Golden Rooster Awards, the 2007 Huabiao Awards, the 2008 Hundred Flowers Awards, and the 2009 Golden Horse Film Awards.

BING

But forests remain an equally strong passion. “Every time I travel along the Yangtze River,” she says, “I remember the summer of 1998 when for three months it was ravaged by severe flooding that washed away thirteen million homes and caused US\$26 billion worth of damage. The floods showed how destructive nature can be in the absence of forests. Yet for decades we have been trying to harvest our economic gains at the cost of unsustainably exploiting our environment and the forests, its most valuable asset.”

The Chinese Government took notice of the 1998 floods, she says, and set up a nationwide campaign to halt deforestation later the same year, with the result that over half of the country’s natural forests are now protected.

“We have learned a lesson the hard way, that our forests support our modern way of life. Without them, nature can wreak havoc. With them, nature can protect us and enrich our ecosystems,” she says.

“Forests provide us with so many services to sustain our lives. I have seen with my own eyes the beauty and strength of a healthy forest that provides the water we drink and protects us during the rainy seasons against landslides and flooding. And a healthy forest brings back wildlife.”

She likes to quote Mahatma Gandhi, who famously stated:

“Your beliefs become your thoughts; your thoughts become your words; your words become your actions; your actions become your habits; your habits become your values; your values become your destiny.”

“We can change our planet’s destiny one country at a time, one community at a time, one individual at a time, one action at a time. Everyone can influence those around them. This will have a positive and exponential effect and attract more and more people to join us,”



UNEP promotes environmentally sound practices globally and in its own activities. This magazine is printed on 100% recycled paper, using vegetable-based inks and other eco-friendly practices. Our distribution policy aims to reduce UNEP's carbon footprint.



International Year of
CHEMISTRY
2011

www.unep.org/ourplanet

Our Planet, the magazine of the United Nations Environment Programme (UNEP)

PO Box 30552, Nairobi, Kenya
Tel: (254 20) 762 1234
Fax: (254 20) 762 3927
e-mail: unepub@unep.org

To view current and past issues of this publication online, please visit
www.unep.org/ourplanet

ISSN 1013 - 7394

Director of Publication : Satinder Bindra

Editor : Geoffrey Lean

Coordinator : Mia Turner

Special Contributor : Nick Nuttall

Distribution Manager : Manyahleshal Kebede

Design : Amina Darani

Produced by : UNEP Division of Communications
and Public Information

Printed by : Progress Press

Distributed by : SMI Books

The contents of this magazine do not necessarily reflect the views or policies of UNEP or the editors, nor are they an official record. The designations employed and the presentation do not imply the expressions of any opinion whatsoever on the part of UNEP concerning the legal status of any country, territory or city or its authority or concerning the delimitation of its frontiers or boundaries.

* All dollar (\$) amounts refer to US dollars.

Cover and Back Photo: © Corbis